The Missouri
Nonpoint Source Management Program
Annual Report
For Federal Fiscal Year FFY2012

MISSOURI
DEPARTMENT
OF NATURAL
RESOURCES

Prepared by the Missouri Department of Natural Resources
Division of Environmental Quality
Water Protection Program, Watershed Protection Section, Nonpoint Source Unit

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December 31, 2012

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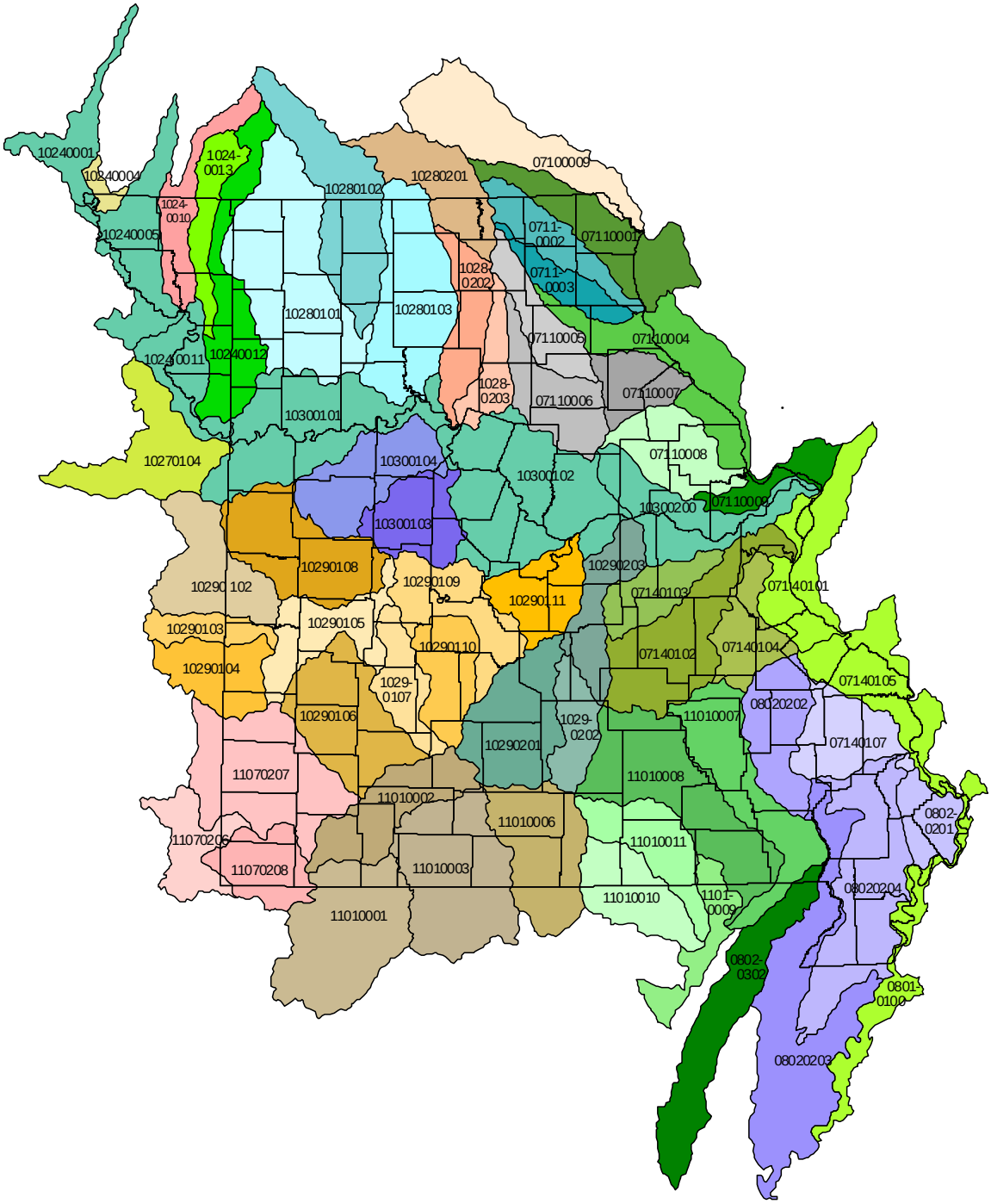
Missouri Hydrologic Unit Delineations by 8-digit Hydrologic Unit Code.



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Missouri Watersheds: HUC 8, USGS Basin name, and Missouri Basin name

HUC 8	USGS Basin Name	Missouri Basin Name
07100009	Lower Des Moines	Des Moines Basin
07110001	Bear-Wyaconda	Wyaconda - Fox Rivers
07110002	North Fabius	North Fabius River Basin
07110003	South Fabius	South Fabius River Basin
07110004	The Sny	North River - Bobs Creek
07110005	North Fork Salt	North Salt River Basin
07110006	South Fork Salt	Middle-South Forks of the Salt River
07110007	Salt	Lower Salt River Basin
07110008	Cuivre	Cuivre River Basin
07110009	Peruque-Piasa	Peruque-Dardenne Creeks
07140101	Cahokia-Joachim	Mississippi River Tribs - St. L-Ste. Gen
07140102	Meramec	Meramec River Basin
07140103	Bourbeuse	Bourbeuse River Basin
07140104	Big	Big River Basin
07140105	Upper Mississippi-Cape Girardeau	Mississippi River Tribs - Ste. Gen-Cape Gir.
07140107	Whitewater	Castor-Whitewater Rivers Basin
08010100	Lower Mississippi-Memphis	Mississippi River Mainstem Below Ohio River
08020201	New Madrid-St. Johns	St. Johns Bayou
08020202	Upper St. Francis	Upper St. Francis Basin
08020203	Lower St. Francis	Lower St. Francis Basin
08020204	Little River Ditches	Little River Ditches
08020302	Cache	Cache River Basin
10240001	Keg-Weeping Water	Missouri River Bottom
10240004	Nishnabotna	Nishnabotna River Basin
10240005	Tarkio-Wolf	Tarkio-Squaw Tributaries Basin
10240010	Nodaway	Nodaway River Basin
10240011	Independence-Sugar	Missouri River Mainstem
10240012	Platte	Platte River Basin
10240013	One Hundred and Two	102 River Basin
10270104	Lower Kansas	Kansas River Basin
10280101	Upper Grand	Upper Grand River Basin
10280102	Thompson	Thompson River Basin
10280103	Lower Grand	Middle Grand River Basin
10280201	Upper Chariton	Upper Chariton River Basin
10280202	Lower Chariton	Lower Chariton River Basin
10280203	Little Chariton	Little Chariton River Basin
10290102	Lower Marais Des Cygnes	Maries des Cygnes River Basin
10290103	Little Osage	Little Osage River Basin
10290104	Marmaton	Marmaton River Basin
10290105	Harry S. Truman Reservoir	Upper Osage River Basin

HUC 8	USGS Basin Name	Missouri Basin Name
10290106	Sac	Sac River Basin
10290107	Pomme De Terre	Pomme de Terre River Basin
10290108	South Grand	South Grand River Basin
10290109	Lake of the Ozarks	Lake of Ozarks Basin
10290110	Niangua	Niangua River Basin
10290111	Lower Osage	Lower Osage River Basin
10290201	Upper Gasconade	Upper Gasconade River Basin
10290202	Big Piney	Big Piney River Basin
10290203	Lower Gasconade	Lower Gasconade River Basin
10300101	Lower Missouri-Crooked	Missouri River Mainstem - KC to Glasgow
10300102	Lower Missouri-Moreau	Missouri River Mainstem - Glasgow to Hermann
10300103	Lamine	Lamine River Basin
10300104	Blackwater	Blackwater River Basin
10300200	Lower Missouri	Missouri River Mainstem - Hermann to St. Louis
11010001	Beaver Reservoir	Table Rock Lake Basin
11010002	James	James River Basin
11010003	Bull Shoals Lake	Bull Shoals Lake Basin
11010006	North Fork White	North Fork White River Basin
11010007	Upper Black	Black River Basin
11010008	Current	Current River Basin
11010009	Lower Black	Fourche Creek Basin
11010010	Spring	Spring River Basin (Howell/Oregon counties)
11010011	Eleven Point	Eleven Point River Basin
11070206	Lake O’ the Cherokees	Cherokees Lake Basin
11070207	Spring	Spring River Basin
11070208	Elk	Elk River Basin

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I. Missouri's Nonpoint Source Management Program

A. Mission Statement

The mission of Missouri's Nonpoint Source Management Program (the program) is to preserve and protect the quality of the water resources of the state from nonpoint source impairments.

Goal A: Water Quality Assessment, Monitoring and Prioritization
Continue and enhance statewide water quality assessment processes to evaluate water quality and prioritize watersheds affected by nonpoint source (NPS) pollution.

Goal B: Water Quality Improvement and Protection
Improve water quality by implementing NPS-related projects and other activities.

Goal C: **State Nonpoint Source Program Management**
Maintain a viable, relevant, and effective program with the flexibility necessary to meet changing environmental conditions and regulations.

Fulfilling the water quality protection mission of the Missouri Nonpoint Source Management Program can be accomplished only with the cooperation of other resource agencies and the citizens of the state. Nonpoint source pollution occurs when water runs over land or through the ground, picks up natural or human-made pollutants, and deposits them in surface waters or ground water. As administrator of the program, the Missouri Department of Natural Resources and its partners continue to make significant progress in the protection of water, as well as air and land resources.

This document reports the impacts being made by the Department and its partners in the control and abatement of nonpoint source pollution through the 319-grant program and collaborative efforts in the State of Missouri during the Federal Fiscal Year 2012 (October 1, 2011 through September 30, 2012).

B. Missouri Nonpoint Source Program Current Status

The Missouri Nonpoint Source Management Plan (NPSMP), initially approved and implemented in June 2000, is a five-year plan that contains broad goals intended to identify the general activities necessary to achieve the program's mission statement: *Preserve and protect the quality of the water resources of the state from nonpoint source impairments*. Objectives reflect the five-year life of the NPSMP, though some objectives are on-going and others have, to date, only been achieved to varied degrees. Specific sections of the NPSMP were updated, according to a prescribed schedule, in 2001-2005. Program mission, goals, and objectives went under review starting in 2007 to develop a more realistic and improved watershed-based approach, ensure objectives are appropriate for reaching the goals, and if the goals are appropriate for achieving the mission.

Beginning in 2010 new national 319 Nonpoint Source Program guidance developments commenced, driven by 319 program reviews performed by the Government Accountability Office and the Environmental Protection Agency (EPA) Nonpoint Source Control Branch for submittal to the Office of Management and Budget. Based upon those findings and state discussions, final program guidance will be published in 2012, including *Key Components to an Effective State Nonpoint Source Management Program*; replacing the *Nine Key Elements of an Effective State Program* that are included in this FFY2012 report. After new guidance is finalized and released, review of Missouri's current draft Nonpoint Source Management Plan will continue and an update of the NPSMP will be submitted to EPA for comment by September 31, 2013 and completed in early 2014. The current approved NPSMP may be found at http://www.dnr.mo.gov/env/wpp/nps/mgmtplan/index.html.

C. Missouri's Nine Key NPS Program Elements

The following elements provide the framework for Missouri's NPSMP. Missouri's approach to the nine key elements is outlined beginning on page 20 in the NPSMP: found at http://www.dnr.mo.gov/env/wpp/nps/mgmtplan/index.html. To determine the progress, specifically the successes, of the program, the Department must continually endeavor to satisfy the intent of these nine key elements.

1. The state program contains explicit short and long-term goals, objectives, and strategies to protect surface and ground water.

2. The state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional and local entities (including conservation districts), private sector groups, citizen groups, and federal agencies.

3. The state uses a balanced approach that emphasizes both statewide programs and on-the-ground management of individual watersheds where waters are impaired or threatened.

4. The state program (a) abates known water quality impairments from NPS pollution and (b) prevents significant threats to water quality from present and future NPS activities.

5. The state program identifies waters and their watersheds impaired by NPS pollution and identify important unimpaired waters that are threatened or otherwise at risk. Further, the state establishes a process to progressively address these identified waters by conducting more detailed watershed assessments and developing watershed implementation or management plans, and then implementing the plans.

6. The state reviews, upgrades, and implements all program components required by section 319(b) of the Clean Water Act, and establishes flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable. The state programs include:

    - A mix of water quality-based and/or technology-based programs designed to achieve and maintain beneficial uses of water; and

    - A mix of regulatory, non-regulatory, financial, and technical assistance as needed to achieve and maintain beneficial uses of water as expeditiously as practicable.

7. The state identifies federal lands and activities, which are not managed consistently with state program objectives. Where appropriate, the state seeks EPA assistance to help resolve issues.

8. The state manages and implements its program efficiently and effectively, including necessary financial management.

9. The state periodically reviews and evaluates its program using environmental and functional measures of success and revises its NPS assessment and its program at least every five years.

II. 319 NPS Source Grant Program Overview

A. Missouri Section 319(h) Nonpoint Source Management Grants

NPS grant funds are provided from EPA through Section 319(h) of the Clean Water Act. Funds are used to address nonpoint sources of pollution and are administered from EPA through the Department to eligible pass-through recipients and for NPS program administration. Funds can be used to address NPS pollution through information/education, water quality monitoring, demonstrations, and implementation of practices that preserve, conserve, restore, or improve water quality. Eligible recipients of pass-through funds include state and local agencies, educational institutions, and non-profit organizations. The Department may award pass-through grant funds to eligible recipients noncompetitively or through a request for proposals (RFP) describing the grant opportunity. Since 2009, a portion of 319 funds have been utilized through the Department's Performance Partnership Grant (PPG).

B. Priorities and Project Selection Process

Selection for Section 319 funding emphasizes projects that restore the quality of waters on the state's 303(d) List due to nonpoint sources. However, other high quality NPS projects are encouraged. Highest priority for funding is assigned to eligible projects addressing agricultural, urban, and abandoned coal mine land. Priorities that help guide the selection process are established in the NPSMP.

To manage these priorities, three types of subgrants were offered in FFY2012: major subgrants, minigrants, and watershed planning subgrants. Funding limitations relating to availability of base funding and incremental fund eligibility impacted the solicitation and award amounts available for minigrants and watershed planning grants. Specifically, only older grants had Base funding available for minigrants and the allocation of funds for watershed planning was temporarily depleted until a new allocation could be added. Specific subgrant awards for 2012 are provided later in Section III in Tables 9 and 10.

Major subgrants in 2012 were awarded through a RFP. Typically a 319 RFP is provided to entities on an extensive mailing list of past and current water quality partners, electronically to members of the Water Quality Coordinating Committee, advertised on the Department's website, provided to all Soil and Water Conservation Districts and NRCS offices, Regional Planning Organizations, and distributed at various conferences, meetings, and events. In 2012 the RFP was also provided to county government seats in Missouri. The grant availability is announced in Departmental newsletters, by our resource partners, and via press release. Applicant proposals are submitted and reviewed by a committee including NPS staff and the EPA Region 7 NPS Program Coordinator. Final recommendations from the committee need confirmation by the Department and approval by EPA.

The RFP for grant year 2011 (active project selection in 2012) was focused in watersheds with a Department-accepted Watershed Management Plan (WMP) addressing NPS pollution and a TMDL. A telephone conference was held for potential applicants on June 27, 2012 to discuss project ideas and RFP questions. Project focus areas in the RFP included NPS concerns with agricultural, urban or urban development, abandoned mine land, hydrologic modifications in streams, and issues within parks or other managed natural areas. Applications were due by the close of business on July 1, 2011. In an effort to improve the quality of nonpoint source projects and their achievements, eligibly requirements were stricter than previous years. Watersheds were prioritized based upon several criteria including: Department accepted WMP and 303(d) list, presence of a TMDL, fiscal capabilities, salary/implementation ratio; previous grant experience, amount of implementation, probability of success, schedule/BMP specifics, and more.

Minigrants have been an effective part of Missouri's NPS program since 1997. Over the years various changes have taken place relating to award amounts, project periods, priorities, and frequency of acceptance. In 2012, applications accepted twice per year; due on October 1, 2011 and April 1, 2012. These projects awards were $10,000 or less and lasted up to 24 months. Minigrants are traditionally educational or outreach oriented, occurring in various watersheds or other geographic regions throughout the state. Consequently, they are seldom eligible for incremental funding. Late in FFY 2012, availability of base funding became more

limited because of new minigrant awards and newer base funds being placed in the PPG. Minigrants are currently accepted by special arrangement with the Department. Applications are reviewed, prioritized, and rated by an in-house review committee. Selected projects are recommended for funding to the Department. In FFY2012, nine minigrants were awarded for a total of approximately $82,500.

Watershed Management Planning Subgrants were available in FFY2012 for producing nine-element watershed plans in watersheds with 303(d) listed NPS impairments. Applications were accepted three times in 2012; due February 1, June 1, and September 1. Awards were a maximum of $30,000 with the intent of $10,000 of this amount would be directed towards monitoring and assessment effort to help develop the watershed management plan. Projects periods last up to 24 months. The focus of this program is to produce high quality watershed management plans that incorporate EPA's nine critical elements.

EPA traditionally allowed the use of incremental funding to support Missouri's watershed planning subgrant effort. A distinct funding pool was created and specific amounts were allocated to that pool from several grants for planning purposes. During FFY2012, funds allocated for these plans were depleted and, like minigrants, applications are now accepted by special arrangement with the Department. Currently, the Department is reevaluating watershed planning process to improve quality and ensure that watershed planning does not unreasonably exceed implementation efforts. In FFY2012, two new Watershed Management Planning Subgrants were awarded for a total of $60,000.

C. Measuring Benefits of the Section 319(h) Nonpoint Source Management Grant Program

In 2012, NPS 319 grants have accomplished noteworthy results in the control and mitigation of NPS pollution in the State of Missouri. By focusing funding on water quality information and education, outreach, implementation of practices, and remediation of existing water quality problems, 319 grant funding has proven to be a valuable resource to the citizens of Missouri.

Water bodies achieve water quality standards through education and active management practices. The 319 NPS Management Grant Program strives to provide Missouri citizens with choices, tools, and decision-making skills that will benefit water quality through education in the use and protection of natural resources and through implementation of best management practices (BMP). BMPs are used to control the production or delivery of pollutants from agricultural, mining, and urban activities to water resources, and to prevent decline of the physical and biological integrity of surface and ground water. BMPs can be either structural or managerial.

Structural BMPs include physical structures or materials that are used to protect water quality and slow water velocities to prevent soil erosion. Some examples are animal waste facilities, sediment basins, silt fences, check dams, water diversions, and grade stabilization.

Managerial BMPs address how projects are implemented; primarily the method of carrying out a project. Examples of managerial BMPs include nutrient and pest management,

rotational grazing, conservation tillage, street sweeping, use of native plants, and practices that minimize or prevent soil erosion. It can be difficult to quantify the benefits of managerial BMPs because they are often represented by philosophical changes among land managers.

BMPs promote sustainability and may be reproduced to achieve comparable results in other locations. Some BMPs are founded in research that identifies potential for measured reductions in pollution that will be achieved through use of the practice.

Missouri's NPSMP, Goal B, specifies that the state will "Improve water quality by implementing NPS-related projects and other activities." Water quality benefits are often difficult to quantify and BMP implementation can take a considerable period of time before improvements to water quality can be measured. In Section II.C.2., the Department has estimated the number of BMPs implemented as a direct result of 319 NPS grants for 2012. Load reductions data collection is not all-inclusive, as not all projects are required to report, but it does indicate that the 319 NPS Program is having a noteworthy, positive impact on the state's water quality.

As indicated in Missouri's key elements, a successful NPS program identifies nonpoint sources and causes of water quality impairments; but an effective watershed-based approach considers both non-regulatory and regulatory concerns. As pollution sources are identified and prioritized within the watershed, management and conservation practices can be planned, scheduled and implemented. To measure success, these NPS activities are strongly dependent upon water quality permitting of point sources to identify and help quantify loading from nonpoint sources. Consequently, current NPDES permit incidences for FFY 2012 by HUC are tabulated below in Table 1.

Table 1. NPDES Permit Incidences by HUC

HUC 8	Permits	HUC 8	Permits	HUC 8	Permits	HUC 8	Permits	HUC 8	Permits
07100009	7	07140105	233	10240013	79	10290108	341	11010003	331
07110001	70	07140107	168	10270104	13	10290109	651	11010006	28
07110002	57	08010100	25	10280101	200	10290110	165	11010007	159
07110003	41	08020201	87	10280102	68	10290111	131	11010008	74
07110004	188	08020202	147	10280103	127	10290201	221	11010009	2
07110005	68	08020203	74	10280201	31	10290202	107	11010010	58
07110006	171	08020204	220	10280202	59	10290203	87	11010011	45
07110007	88	08020302	4	10280203	89	10300101	1080	11070206	21
07110008	241	10240001	1	10290102	34	10300102	1003	11070207	598
07110009	249	10240004	5	10290103	8	10300103	208	11070208	165
07140101	410	10240005	69	10290104	45	10300104	225	Unassigned	239
07140102	435	10240010	28	10290105	74	10300200	514	**TOTAL**	**12,490**
07140103	190	10240011	245	10290106	224	11010001	252		
07140104	206	10240012	194	10290107	110	11010002	703		

Comment
This report only contains permit counts for effective and expired permits (i.e., active permits). Terminated permits are not included.

1. Pass-through NPS Projects in FFY 2012

Missouri's Nonpoint Source program staff managed sixty nine (69) projects during FFY 2012. As acknowledged by EPA Headquarters and Region 7, some project successes are not easily captured using the Grant Reporting and Tracking System (GRTS) and EPA's strategic plan measure, WQ10 Success Stories. To better demonstrate successful efforts, water quality improvements and appropriate use of grant funds this report includes in Appendix A, brief summaries of all active NPS water quality projects during FFY2012.

The project summaries in Appendix A convey a more encompassing portrayal Missouri's pass-through projects than previous annual progress reports. Executive summaries of the active projects allows the reader a better understanding of the grant recipients, their intent, scope of work, and the achievements that may not be readily captured using some other progress reporting methods.

2. Summary of FY12 Project Evaluation Measures

The data contained in the following charts was compiled from information submitted by 319 subgrant project sponsors and reflects the activities conducted as part of their projects during this reporting period. Project sponsors reported these project activities and load reductions on a statewide, regional, or HUC 8 basis (Tables 3-5). Table 2 summarizes cumulatively, all activities regardless of range.

Table 2, on the following page, entitled "Summary of FFY12 319 NPS Project Evaluation Measures: All Activities," represents a summary of results for all 319-related project activities in FFY12.

Table 3, titled "Summary of FFY12 319 NPS Project Evaluation Measures: Statewide," shows only projects that reported statewide achievements and were not designated to a specific watershed level or specific HUC 8.

Table 4, titled "Summary of FFY12 319 NPS Projects Evaluation Measures: Regional," shows only projects that reported achievements on a regional basis (multiple HUCs or county(ies)) as opposed to statewide or by individual HUC. These projects impacted more than one HUC.

Table 5, titled "Summary of FFY12 319 NPS Projects Evaluation Measures: 8 digit HUC Summary," provides a summary of achievements at watershed (HUC) levels.

Table 2: Summary of FFY12 319 NPS Project Evaluation Measures: All Activities

Summary of All Data for FFY12 319 NPS Project Evaluation Measures

Year	2012
All Data	

Activities									
Planning		Groups Formed	Meetings Held	Ave Attendees	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		27	149	485	29	8	0	0	21
						Acres	Acres	Acres	Acres
						242138	0	0	61351

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		31	22	27	65	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Particpants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		63	2535	63	1978	21	1059	0	0	239	37

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		32	3205	96	104798	118	79505	24	1176	43

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		11	5	10	17	444	194	154	127

Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remedations
Totals		6	1	0	1

Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		124	3899	1800	113	29	500	744

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	lbs of Manure Transferred Out
Totals		1	0	1	20	0	0	0

Table 3: Summary of FFY12 319 NPS Project Evaluation Measures: Statewide

Summary of All Statewide 319 NPS Project Evaluation Measures for FFY12

Year	2012
Statewide	

Activities									
Planning		Groups Formed	Meetings Held	Ave Attendees	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		1	4	10	0	0	0	0	0
						Acres	Acres	Acres	Acres
						0	0	0	0

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		0	0	0	0	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Particpants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		0	0	8	136	0	0	0	0	8	1

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		0	0	4	10000	26	63496	0	0	0

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		0	1	8	8	12	76	4	20

Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remedations
Totals		0	0	0	0

Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		0	0	0	0	0	0	0

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	llbs of Manure Transferred Out
Totals		0	0	0	0	0	0	0

Table 4: Summary of FFY12 319 NPS Project Evaluation Measures: Regional

Summary of All Region 319 NPS Project Evaluation Measures for FFY12

Year	2012
Region	

Activities									
Planning		Groups Formed	Meetings Held	Ave Attendees	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		3	24	160	2	0	0	0	2
						Acres	Acres	Acres	Acres
						0	0	0	40000

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		1	0	4	12	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Particpants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		5	397	6	337	0	0	0	0	1	0

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		2	2	22	4454	2	280	0	0	0

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		2	0	0	0	0	9	30	14

Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remedations
Totals		0	0	0	0

Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		20	36	1176	14	4	0	0

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	llbs of Manure Transferred Out
Totals		0	0	0	0	0	0	0

Table 5: Summary of FFY12 319 NPS Project Evaluation Measures: HUC Summary

Summary of All HUC 319 NPS Project Evaluation Measures for FFY12

Year	2012
HUC	

Activities									
Planning		Groups Formed	Meetings Held	Ave Attendees	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		23	121	315	27	8	0	0	19
						Acres	Acres	Acres	Acres
						242138	0	0	21351

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		30	22	23	53	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Particpants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		58	2138	49	1505	21	1059	0	0	230	36

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		30	3203	70	90344	90	15729	24	1176	43

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		9	4	2	9	432	109	120	93

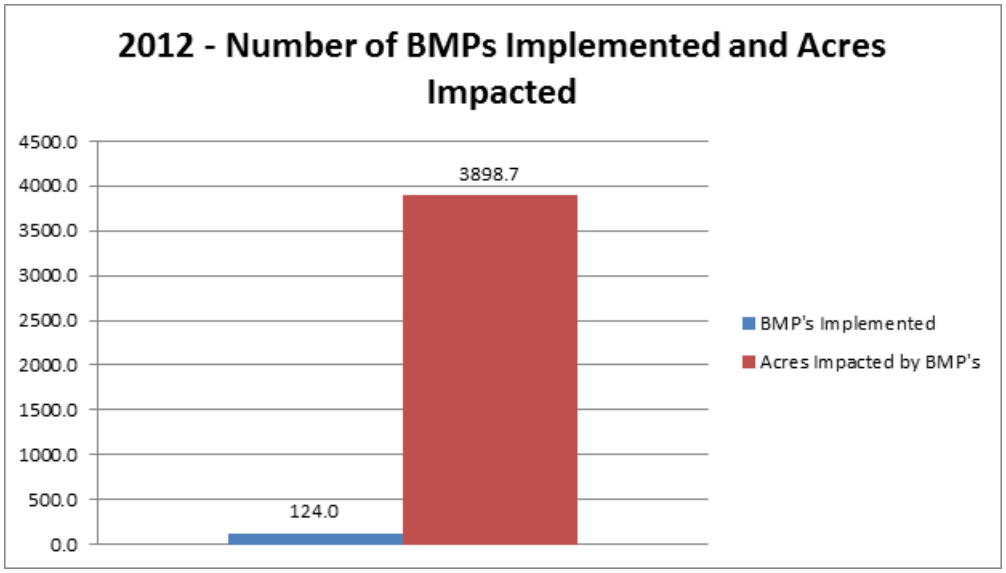
Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remedations
Totals		6	1	0	1

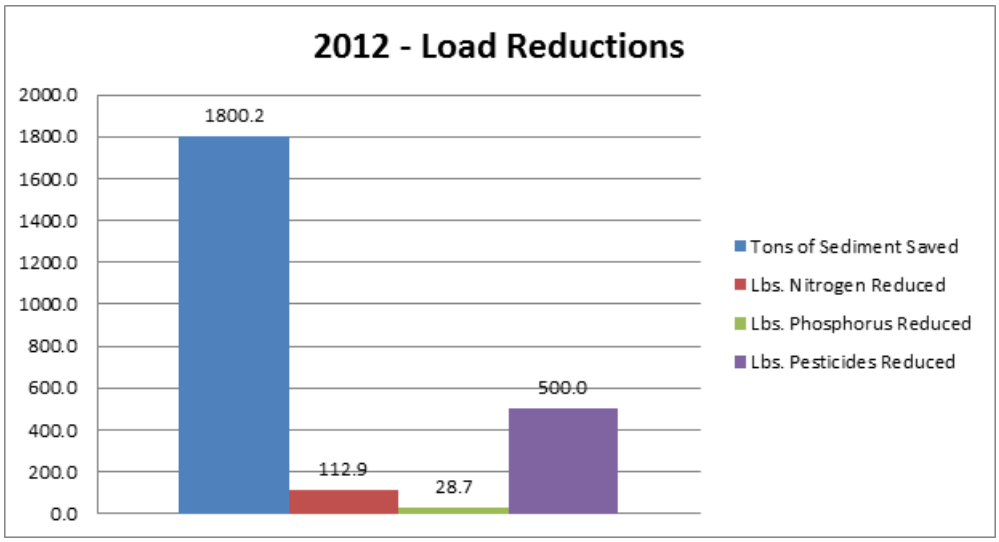
Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		104	3863	624	99	25	500	744

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	lbs of Manure Transferred Out
Totals		1	0	1	20	0	0	0

Table 6: Number of BMPs and Sediment, Nitrogen, Phosphorus and Pesticide load reductions by 319 projects for the FFY 2012.

Data is based upon the load reductions reported by the sponsoring organizations in their annual report.





3. Success Stories – EPA Published

A primary measure of state nonpoint source program success is taken directly from EPA's 2011 strategic plan: Goal 2: Protecting America's Waters, Objective 2.2: Protect and Restore Watersheds and Aquatic Ecosystems. The measure, referred to as WQ10 states: *By 2015, improve water quality conditions in 330 impaired watersheds nationwide using the watershed approach (cumulative).*

Under EPA's 2007 and 2011 strategic plan reporting requirements for WQ10, Missouri has submitted and had published on EPA's website (http://water.epa.gov/polwaste/nps/success319/) eight (8) success stories for eleven (11) water bodies that were removed from the 303(d) list of impaired waters using the 319 nonpoint source efforts and a collaborative watershed based approach to meet water quality standards.

4. Water Quality Assessment Indicators of Progress

The 305(b) Report provides a summary of water quality in Missouri. It assesses how well the waters of the state are meeting national Clean Water Act goals. The report also contains maps showing what waters in the state are impaired, what pollutants affect them, and the sources of those pollutants.

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

The following table presents the waters that were identified as impaired on the 2010 List of Impaired Waters that are proposed for delisting in 2012.

Table 7. Waters Appearing on the 2010 303(d) List of Impaired Waters but Proposed for De-Listing in 2012 for Meeting Water Quality Standards

In addition to these listings, there are 45 additional 2010 listings for nutrients in lakes that will be removed from the list due to removal of the nutrient criteria from state standards.

WBID	Water Body Name	County	Pollutant	Source	Reason for Delisting
2760	Bee Fk.	Reynolds	Lead (S)	Fletcher Mine	WQS now met
0035	Bobs Cr.	Lincoln	Low D.O.	Lincoln Co. PSWD #1	WQS now met, WWTP upgraded
1371	Brush Cr.	Polk/St. Clair	Org. Sediment	Humansville WWTP	data shows sediment is not high
3203	Center Cr.	Jasper	Bacteria	Rural NPS	WQS now met
221	Dardenne Cr.	St. Charles	Inorg. Sediment	Unknown	WQS now met
2186	Fishpot Cr.	St. Louis	Low D.O.	Unknown	WQS now met
2184	Grand Glaize Cr.	St. Louis	Bacteria	Urban NPS	WQS now met
1713	Gravois Cr.	St. Louis	Low D.O.	Unknown	WQS now met
7384	Grindstone Res.	DeKalb	Chlorophyll	Rural NPS	WQS now met

3256	Indian Cr.	Newton	Unknown	Unknown	WQS now met
7055	Lake Ste. Louise	St. Charles	Bacteria	Urban Runoff/Storm Sewers	WQS now met
7336	Lake Wappapello	Wayne	Nitrogen	Rural NPS	WQS now met
3490	Little Muddy Cr., Trib	Pettis	Color	Tyson Foods	WQS now met
1709	Maline Cr.	St. Louis	Low D.O.	Urban NPS	WQS now met
7136	Marceline New Lake	Chariton	Nitrogen	Rural NPS	WQS now met
7402	Mozingo Lake	Nodaway	Chlorophyll	Rural NPS	WQS now met
0853	Muddy Cr.	Pettis	Color	Tyson Foods	WQS now met
1031	Osage R.	Miller	Total Diss. Gases	Bagnell Dam	WQS now met.
217	Peruque Cr.	St. Charles	Inorg. Sediment	Urban/Rural NPS	WQS now met
218	Peruque Cr.	St. Charles	Inorg. Sediment	Urban/Rural NPS	WQS now met
0743	Renfro Cr.	Callaway	Low D.O.	Unknown	WQS now met
0884	Richland Creek	Morgan	Low D.O.	Unknown	WQS now met
1710	River des Peres	St. Louis	Low D.O.	Unknown	WQS now met

Currently, Missouri's Nonpoint Source Management Plan uses the 1998 303(d) list as a base for which to measure progress. Missouri believes that 104 impairments identified in the list now meet state water quality standards, or approximately 49%. Approximately 82 water bodies identified on that list have restored or partially restored water quality. Restoration was achieved through the various processes including permits, compliance, education, and changing management practices. Below is a list of 1998 303(d) water body-pollutant pairs that now meet standards.

Table 8: Water Body/Pollutant Pairs on 1998 Missouri 303(d) Returned to Compliance with WQ Standards by Jan. 2010

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
1224	Big Otter Cr.	pH	AML	1	Mi.	Henry/St. Clair	Much data since 1998. WQS now met.
859	Brushy Cr.	BOD	Sedalia Central WWTP	1	Mi.	Pettis	Data since 1998. WQS now met.
859	Brushy Cr.	NFR	Sedalia Central WWTP	1	Mi.	Pettis	Data since 1998. WQS now met.
859	Brushy Cr.	Ammonia	Sedalia Central WWTP	1	Mi.	Pettis	Data since 1998. WQS now met.
3269	Buffalo Cr.	Nutrients	CAFOs	8	Mi.	Newton/McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
3273	Buffalo Cr.	Nutrients	CAFOs	1.7	Mi.	Newton	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
709	Bynum Cr.	Sediment	Limestone Quarry	0.3	Mi.	Callaway	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
103	Salt R. Re-reg Pool	Iron	Cannon Dam	10	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
103	Salt R. Re-reg Pool	Manganese	Cannon Dam	10	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
737	Cedar Cr.	Sulfate	AML	4	Mi.	Callaway/Boone	Data since 1998. WQS now met. Biomonitoring still indicates some concerns.
737	Cedar Cr.	pH	AML	1	Mi.	Callaway/Boone	Data since 1998. WQS now met. Biomonitoring still indicates some concerns.
3238	Clear Cr.	BOD	Monett WWTP	1	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3238	Clear Cr.	NFR	Monett WWTP	1	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3238	Clear Cr.	Ammonia	Monett WWTP	1	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3239	Clear Cr.	BOD	Monett WWTP	2	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3239	Clear Cr.	NFR	Monett WWTP	2	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3239	Clear Cr.	Ammonia	Monett WWTP	2	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
690	Dark Cr.	Sulfate	AML	8	Mi.	Randolph	Data since 1998. WQS now met.
912	Davis Cr.	Low DO	Odessa SE WWTP	2	Mi.	Lafayette	New WWTP since 1998. Data since 1998 shows WQS now met.
2604	Eleven Point R.	Chlorine	Willow Springs WWTP	0.4	Mi.	Oregon	Improved disinfection at WWTP. Data since 1998 shows WQS now met.
3246	Elk R.	Nutrients	CAFOs	21.5	Mi.	McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
2860	Goose Cr.	Nickel	Madison Mine	0.5	Mi.	Madison	Mine discharged eliminated. Data since 1998 shows WQS now met.
1251	Honey Cr.	Sulfate	AML	3	Mi.	Henry	Data since 1998. WQS now met.
2582	Howell Cr.	Chlorine	West Plains WWTP	0.3	Mi.	Oregon	Data since 1998. WQS now met.
3259	S. Indian Cr.	Nutrients	CAFOs	9	Mi.	Newton	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
3260	N. Indian Cr.	Nutrients	CAFOs	5	Mi.	Newton	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
2347	James R.	Nutrients	Multiple Pt/NPS	29.4	Mi.	Stone	Nutrient levels have declined due to point source controls. No numeric criteria in WQS.
2362	James R.	Nutrients	Multiple Pt/NPS	23.5	Mi.	Stone/Greene	Nutrient levels have declined due to point source controls. No numeric criteria in WQS.
2365	James R.	Nutrients	Primarily NPS	2	Mi.	Greene	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
1016	Kelley Br.	Habitat Loss	ORV Use	1	Mi.	Boone	Finger Lakes SP initiated changes to protect stream. Visual survey indicates improvement.
535	Long Cr.	Sediment	Limestone Quarry	0.2	Mi.	Caldwell	Data since 1998. WQS now met.
942	N. Moreau Cr.	NFR	California S. WWTP	10	Mi.	Cole	Lagoon replaced w/mechanical WWTP since 1998. Effluent is low in NFR.
1300	Mound Br.	Ammonia	Butler WWTP	1	Mi.	Bates	Data since 1998. WQS now met.
855	Muddy Cr.	BOD	Sedalia Central WWTP	33	Mi.	Pettis	Data since 1998. WQS now met. This portion of stream is now part of WBID 853.
1305	Mulberry Cr.	Sulfate	Reclaimed mined land	8	Mi.	Bates	Data since 1998. WQS now met.
3268	Patterson Cr.	Nutrients	CAFOs	2	Mi.	McDonald	No numeric WQS for nutrients. Insufficient data to determine WQ time trend.
1714	Rock Cr.	BOD	2 WWTPs	2	Mi.	Jefferson	2 WWTPs eliminated. WQS now met.
1714	Rock Cr.	Ammonia	2 WWTPs	2	Mi.	Jefferson	2 WWTPs eliminated. WQS now met.
1014	Rocky Fk.	Sediment	ORV Use	0.5	Mi.	Boone	Visual surveys since 1998 indicate WQS now met.
278	Rush Cr.	BOD	Platte Co. SD WWTP	4	Mi.	Platte	WWTP eliminated since 1998. Subsequent visual survey indicates WQS met.
2190	Saline Cr.	Ammonia	2 WWTPs	2	Mi.	Jefferson	2 WWTPs eliminated. Data since 1998 shows WQS now met.
91	Salt R.	Iron	Cannon Dam	29	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
91	Salt R.	Manganese	Cannon Dam	29	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
3249	L. Sugar Cr.	Nutrients	CAFOs	11	Mi.	McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
3250	B. Sugar Cr.	Nutrients	CAFOs	35	Mi.	Barry/McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
1282	E. Fk. Tebo Cr.	pH	AML	1	Mi.	Henry	Data since 1998. WQS now met.
1292	W. Fk. Tebo Cr.	Sulfate	AML	7	Mi.	Henry	Data since 1998. WQS now met.
2850	Trace Cr.	pH	Sawmill	4.7	Mi.	Madison	Sawdust management improved, leachate eliminated. 0.8 mi. still impaired by natural conditions
1211	Trib. Barkers Cr.	pH	AML	0.3	Mi.	Henry	Erroneously assigned to WBID 1211, is actually on unclassified trib. Trib. Still impaired.
1505	Whetstone Cr.	BOD	2 Mtn Grove WWTPs	2	Mi.	Wright	1 WWTP upgraded. Data since 1998 indicates WQS now met.
1719	Cameron Lake #3	Atrazine	Row crop farming	96	Ac.	DeKalb	Data since 1998. WQS now met.
7120	Cameron Lake #1	Atrazine	Row crop farming	25	Ac.	DeKalb	Data since 1998. WQS now met.
7121	Cameron Lake #2	Atrazine	Row crop farming	35	Ac.	DeKalb	Data since 1998. WQS now met.
7237	Fellows Lake	Algae	Ag/Urban NPS	820	Ac.	Greene	Only one episode of taste/odor complaints in last 20 years
7124	Hamilton Lake	Cyanazine	Row crop farming	80	Ac.	Caldwell	Cyanazine banned from all uses in 2001. WQ monitoring state-wide shows no occurrence.
7190	Higginsville Lake	Atrazine	Row crop farming	223	Ac.	Lafayette	Data since 1998. WQS now met.
7022	LaBelle Lake #1	Atrazine	Row crop farming	17	Ac.	Lewis	Data since 1998. WQS now met.
7023	LaBelle Lake #2	Atrazine	Row crop farming	112	Ac.	Lewis	Data since 1998. WQS now met.
7033	Mark Twain Lake	Atrazine	Row crop farming	18600	Ac.	Monroe	Data since 1998. WQS now met.

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
7031	Monroe City Rt. J Lake	Atrazine	Row crop farming	94	Ac.	Monroe	Data since 1998. WQS now met.
7031	Monroe City Rt. J Lake	Cyanazine	Row crop farming	94	Ac.	Monroe	Cyanazine banned from all uses in 2001. WQ monitoring state-wide shows no occurrence.
7077	Smithville Lake	Atrazine	Row crop farming	7190	Ac.	Clay	Data since 1998. WQS now met.
7205	Truman Lake	Manganese	Natural	10000	Ac.	Henry	Levels have not declined. Secondary DW Standard removed from state WQ Standards
7032	Vandalia Lake	Atrazine	Row crop farming	37	Ac.	Audrain	Data since 1998. WQS now met.
1250	Big Cr.	Sediment	Ag. NPS	49	Mi.	Johnson	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
449	W. Fk. Big Cr.	Sediment	Ag. NPS	18	Mi.	Harrison	EPA approved de-listing based on "reference stream" status*
436	Big Muddy Cr.	Sediment	Ag. NPS	8	Mi.	Daviess	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
653	Blackbird Cr.	Sediment	Ag. NPS	6	Mi.	Adair	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
921	S. Fk. Blackwater R.	Sediment	Ag. NPS	5	Mi.	Johnson	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
1336	Clear Cr.	Sediment	Ag. NPS	18	Mi.	Vernon	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
372	E. Fk. Crooked Cr.	Sediment	Ag. NPS	14	Mi.	Ray	EPA approved de-listing based on "reference stream" status*
865	Flat Cr.	Sediment	Ag. NPS	20	Mi.	Pettis	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
502	Grindstone Cr.	Sediment	Ag. NPS	16	Mi.	DeKalb	EPA approved de-listing based on "reference stream" status*
457	E. Fk. Grand R.	Sediment	Ag. NPS	25	Mi.	Gentry	EPA approved de-listing based on "reference stream" status*
468	M. Fk. Grand R.	Sediment	Ag. NPS	25	Mi.	Gentry	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
337	Honey Cr.	Sediment	Ag. NPS	8.5	Mi.	Nodaway	EPA approved de-listing based on "reference stream" status*
554	Honey Cr.	Sediment	Ag. NPS	23	Mi.	Livingston	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
212	Indian Camp Cr.	Ammonia	Landfill	0.3	Mi.	Warren	Data since 1998. WQS now met.
612	W. Fk. Locust Cr.	Sediment	Ag. NPS	17	Mi.	Linn	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
339	Long Br.	Sediment	Ag. NPS	6	Mi.	Nodaway	EPA approved de-listing based on "reference stream" status*
508	Marrowbone Cr.	Sediment	Ag. NPS	11	Mi.	Daviess	EPA approved de-listing based on "reference stream" status*
619	E. Fk. Medicine Cr.	Sediment	Ag. NPS	36	Mi.	Sullivan	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
623	W. Fk. (Little) Medicine Cr.	Sediment	Ag. NPS	Lower 20	Mi.	Mercer	Normal Invertebrate community. Upper 20 mi. still impaired based on biological monitoring
1299	Miami Cr.	Sediment	Ag. NPS	18	Mi.	Bates	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
345	White Cloud Cr.	Sediment	Ag. NPS	11	Mi.	Andrew	EPA approved de-listing based on "reference stream" status*
674	Mussel Fk.	Sediment	Ag. NPS	29	Mi.	Sullivan	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
81	North R.	Sediment	Ag. NPS	40	Mi.	Marion	EPA approved de-listing based on "reference stream" status*
121	M. Fk. Salt R.	Sediment	Ag. NPS	49	Mi.	Monroe	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
657	Spring Cr.	Sediment	Ag. NPS	18	Mi.	Adair	EPA approved de-listing based on "reference stream" status*
710	Stinson	Ammonia	Fulton WWTP	0.5	Mi.	Callaway	Data since 1998. WQS now met.
248	L. Tarkio Cr.	Sediment	Ag. NPS	17.5	Mi.	Atchison	Monitoring indicates normal aquatic invertebrate community. No biological impairment.

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
7171	Long Branch Lake	Atrazine	Row crop farming	2430	Ac.	Audrain	Cyanazine banned from all uses in 2001. WQ monitoring state-wide shows no occurrence.
417	Blue R.	Chlordane	Urban NPS	4	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
418	Blue R.	Chlordane	Urban NPS	9	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
419	Blue R.	Chlordane	Urban NPS	9	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
421	Blue R.	Chlordane	Urban NPS	2	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
37	Fox R.	Manganese	Natural	12	Mi.	Clark	Secondary DW Standard removed from state WQ Standards
46	Wyaconda R.	Manganese	Natural	8	Mi.	Lewis	Secondary DW Standard removed from state WQ Standards
63	M. Fabius R.	Chlordane	Urban NPS	2	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
7255	Creve Coeur Lake	Chlordane	Urban NPS	300	Ac.	St. Louis	Monitoring since 1998 indicate tissue guidelines now met.
7054	Lake St. Louis	Chlordane	Urban NPS	525	Ac.	St. Charles	Monitoring since 1998 indicate tissue guidelines now met.
7211	Pleasant Hill Lake	Chlordane	Urban NPS	115	Ac.	Cass	Monitoring since 1998 indicate tissue guidelines now met.
76	N. Fabius R.	Manganese	Natural	82	Mi.	Marion	Levels have not declined. Secondary DW Standard removed from state WQ Standards
7205	Lake of the Ozarks	Gas Superst.	Truman Dam	50	Ac.	Benton	Modifications to spillway solved gas supersaturation problems.

III. Summary of FFY12 319 Grant Program Dollars Spent

During FFY2012, $2,219,370 in federal 319 funds was awarded to 21 new projects increasing the active 319 projects to 69 in total for the year. Funding in the amount of $2,405,637.88 was dispersed to 69 active NPS projects (6 contracts, 63 subgrants) in FFY2012 as summarized by grant number below.

319 Grant Dollars Expended for Projects		
Federal Aid Number	**Grant Year**	**Sum of Expended Amount**
C9007407-11	FFY2004	$200,091.46
C9007407-12	FFY2005	$573,388.27
C9007407-13	FFY2006	$477,517.01
C9007407-14	FFY2007	$260,632.90
C9007407-15	FFY2008-2009	$860,045.04
C9007407-16	FFY2010	$33,963.20
Total		**$2,405,637.88**

Of the 69 open subgrants/ contracts, the funds were used to support local, regional, and state 319 NPS pass-through projects. This funding was provided to sponsors for water quality education, demonstration, implementation, modeling, and monitoring. In FFY2012, $1,232,062 was allocated/ awarded to support pass-through NPS projects while, $987,308 was allocated/awarded to support the state's NPS water quality monitoring efforts, such as the USGS Ambient WQ Monitoring Network and Lake of the Ozarks and Pomme de Terre E. Coli Studies. Of the current 69 projects active to date, $14,638,882.29 in total has been awarded to the sponsors for support of nonpoint source activities.

Commonly, Missouri has multiple 319 Nonpoint Source grants open concurrently that provide funding for projects and various other activities related to Missouri's Nonpoint Source Program. Typically, older grant funds are expended first; however due to several variables, such as fluctuating costs and revised workplans, deobligation of funds from projects is not uncommon. Below is a summary of grants that were utilized for all NPS activities during 2012 and total amounts expended from each.

Total 319 Dollars Expended		
FEDERAL AID NUMBER	**GRANT YEAR**	**SUM OF EXPENDED AMOUNT**
BG997313113Z	FFY2012 PPG	$822,775.78
C9007407-11	FFY2004	$201,012.11
C9007407-12	FFY2005	$573,388.27
C9007407-13	FFY2006	$486,192.72
C9007407-14	FFY2007	$260,632.90
C9007407-15	FFY2008-2009	$860,045.04
C9007407-16	FFY2010	$33,963.20
Total		**$3,238,010.02**

The 69 active projects in FY2012 utilized base and/or incremental funding for eligible activities such as implementation, demonstration, outreach, monitoring, education, and watershed planning. Table 9 below lists the active subgrant project name, project identification number, expiration date, and award amounts.

Table 9: Active Projects in FFY 2012

Project Name	Recipient	Grant Number	End Date	Incremental Funds	Base Funds	Match Amount
Western Table Rock Lake WMP Development	Table Rock Lake Water Quality Inc.	C9007407-15	2012/07/01	$15,000		$10,000
Eastern Table Rock Lake WMP Development	Table Rock Lake Water Quality Inc.	C9007407-15	2012/07/01	$15,000		$10,000
Water Watch Week	Missouri Stream Team Watershed Coalition	C9007407-15	2012/08/01		$15,000	$13,316
Boulevard Park Rain Garden and Bioretention System Demo	City of Lake St Louis	C9007407-15	2012/09/30		$10,000	$6,672
Watkins Creek Watershed Management Plan	Greenway Network, Inc.	C9007407-11 C9007407-15	2012/09/30	$23,350		$13,650
Missouri Clean Marina - Upper White River Basin Pilot Program	Upper White River Basin Foundation	C9007407-15	2012/10/01	$10,000		$6,700
Immanuel Rain Gardens for Clean Streams Project	Immanuel Lutheran School	C9007407-15	2012/12/31		$5,770	$3,870
Locust Creek Restoration Project	MDNR /DSP- Pershing Park	C9007407-09 C9007407-12 C9007107-13	2012/12/31		$330,750	$220,500
The Upper Shoal Creek On-Site System Implementation	Shoal Creek Watershed Improvement Group	C9007407-12 C9007407-14	2012/12/31	$29,600	$195,000	$149,741
North Fabius WQ Improvement Project	SWCD Schuyler	C9007407-13	2013/01/31	$477,162		$0
Jefferson Farm Water Quality Demo	Thomas Jefferson Institute	C9007407-09 C9007407-13	2013/01/31	$188,000	$78,000	$182,000
Lake of the Ozarks Niangua Arm WMP	Lake Ozarks Watershed Alliance - Niangua	C9007407-15	2013/02/15	$30,000		$20,000
UMC - Implementing Total Maximum Daily Loads through Locally Developed WMP's	University of Missouri –Columbia	C9007407-12 C9007407-13	2013/02/28	$197,715		$131,823
Quick Creek Park Environmental Education Project	City of Doniphan	C9007407-15	2013/04/30		$10,000	$6,670
NPS Pollution Prevention through Native Plantings in Stormwater Control	Jefferson City Samaritan Center	C9007407-15	2013/04/30		$6,000	$4,000
Keifer Creek Watershed Restoration Project	Missouri Coalition for the Environment	C9007407-15	2013/05/31		$10,000	$7,008
Upper Big River Water Quality Project	SWCD St. Francois Co	C9007407-14	2013/05/31	$70,000	$880,000	$0
Mingo Wildlife Refuge Atmospheric Samples of Mercury	University of Illinois - Yr 3	C9007407-15	2013/06/30	$66,432		$0

Northwoods- - Baden Creek Bank and Water Quality Stabilization	City of Northwoods	C9007407-13	2013/07/14	$611,321		$407,568
Lower Dardenne Creek Watershed Management Plan	City of St Peters	C9007407-13	2013/07/14		$30,000	$27,000
James River Basin Riparian Corridor Restoration and Protection	James River Basin Partnership	C9007407-10 C9007407-14	2013/07/31	$600,000		$400,020
Partnership for Cleaner Water through Illegal Dump Cleanup, Education and Community Involvement	Meramec Regional Planning Commission	C9007407-15	2013/08/31		$10,000	$7,426
Lakes of Missouri Volunteer Program (LMVP)	University of Missouri Columbia	C9007407-11 C9007407-12 C9007407-13 C9007407-15	2013/08/31	$354,523	$11,888	$196,389
Storm Drain Marker Program	City of Rolla Public Works	C9007407-15	2013/09/09		$10,000	$6,670
Mid-Missouri Water Safety Project	Columbia Housing Authority Low-Income Service	C9007407-15	2013/11/30		$8,000	$6,766
Tower Grove Heights Green Alley Project	City of St. Louis	C9007407-15	2013/12/31		$744,000	$496,000
Ozarks Springs-Bull Shoals Field Station Project	Missouri State University	C9007407-15	2013/12/31		$6,913	$4,778
Investigation of E coli at Lake Ozark	USGS - Missouri Water Science Center	C9007407-16	2013/12/31	$42,700		$0
Investigation of E. coli at Lake of Ozarks State Parks Beaches & Monitoring at Pomme De Terre SP	USGS - Water Resource Division	C9007407-16	2013/12/31	$102,300		$0
Asher Creek 319 Project	SWCD Greene Co	C9007407-16	2014/01/31	$134,186		$0
Middle and Upper James River Show-Me Yards, Neighborhoods, Farms and Ranches	James River Basin Partnership	C9007407-16	2014/02/28	$353,506		$235,671
Black Creek Watershed Management Plan	RC & D, Northeast Council	C9007407-15	2014/02/28	$30,000		$0
St. Louis Earth Day Symposium	St Louis Earth Day	C9007407-15	2014/02/28		$10,000	$12,915
MO Botanical Garden Deer Creek Watershed Initiative Phase II	Missouri Botanical Garden	C9007407-15	2014/03/31	$706,724		$471,957
Operation Brightside Demo Garden and Learning Center	Operation Brightside	C9007407-15 C9007407-11	2014/03/31		$218,400	$145,600
Spring River WMP Implementation	Jasper County Commission	C9007407-15	2014/04/14	$331,068		$197,672
Pride of Stride Project	SWCD Scotland County	C9007407-15	2014/04/14		$10,000	$6,667
Hinkson Creek Urban Retrofit Project	Boone County Resource Management	C9007407-15	2014/04/30	$713,266		$523,000
The Gifted Garden Implementation and Ed Project	Lake Area Industries	C9007407-15	2014/04/30		$10,000	$6,700
Wildcat Glades Education Project	Wildcat Glades Conservation	C9007407-15	2014/05/31		$128,401	$85,668

Mill Creek Nonpoint Source Pollution Education and Engagement Program	Missouri Stream Team Watershed Coalition	C9007407-15	2014/08/21		$10,000	$6,670
Statewide Lakes Assessment Project	University of Missouri Columbia	C9007407-12 C9007407-13 C9007407-15	2014/08/31	$134,308	$215,656	$113,527
Well Decommissioning	SWCD Schuyler Co	C9007407-15	2014/09/14	$10,000		$6,667
Keifer Creek Watershed Management Plan	Missouri Coalition for the Environment	C9007407-15	2014/11/30	$30,000		$0
S Grand Great Streets Initiative: Green Infrastructure Retrofits for an Urban Environment	East-West Gateway Council of Governments	C9007407-15	2014/12/31		$429,005	$268,005
LOWA LILs for a Healthy Lake of the Ozarks	Lake of the Ozarks Watershed Alliance	C9007407-13 C9007407-15	2014/12/31	$976,000	$4,000	$653,333
Improving Nonpoint Source Pollution Education through Project WET Workshops	Missouri State University	C9007407-15	2014/12/31		$103,759	$69,176
Belews Creek WMP Implementation Project	Jefferson Co Stormwater Mgmt Div	C9007407-15	2015/03/31		$180,200	$120,133
Dry Branch Watershed: Clear Stormwater and Green Parks Project	City of Wentzville	C9007407-15	2015/04/14		$748,015	$500,000
Springfield/Greene Co Urban Watershed Stewardship Project	Watershed Committee of the Ozarks	C9007407-15	2015/04/30	$1,000,000		$684,900
Table Rock Lake Area Stormwater Planning and Demo Project	Table Rock Lake WQ Inc.		2015/05/31		$550,600	$368,000
Branson Storm Drain Marking Program to Reduce NPS Pollution	City of Branson	C9007407-15	2014/04/30		$3,819	$2,546
On-site System Identification & Remediation Project	Table Rock Lake WQ, Inc.	C9007407-13	2011/10/14	$270,350		$200,000
Low Impact Landscapes (LILs)	Lake of the Ozarks Watershed Alliance	C9007407-11	2011/10/15		$10,000	$6,700
Hinkson Creek Watershed Restoration Project Phase II	Boone County Commission	C9007407-10 C9007407-13	2011/10/31	$117,984		$55,496
Assisting Communities to Implement a Healthy Yards for Clear Streams Program	University of Missouri-Columbia	C9007407-10 C9007407-12	2011/10/31		$3,007	$6,044
Applied Forestry Best Management Practices	MO Forest Products Association	C9007407-15	2011/11/30		$7,500	$5,000
Perry County Karst Protection Project	SWCD Perry Co	C9007407-08 C9007407-12	2011/11/30	$316,371		$261,283
Town Branch of Piper Creek Watershed Management Plan	Bolivar Community Watershed Improvement Group	C9007407-12	2011/12/31	$7,923		$7,060

Missouri Botanical Garden Deer Creek Watershed Initiative	Missouri Botanical Gardens	C9007407-12	2011/12/31	$508,912		$180,605
Stream Care for Landowners Project	Boone County Public Works	C9007407-15	2012/01/31		$9,700	$6,575
Redesigning the Jacks Fork River	RC&D Top of the Ozarks	C9007407-14	2012/04/30	$106,087		$78,547
Upper Sni-A-Bar WMP	West Branch Sni-A-Bar Watershed Coalition	C9007407-15	2012/09/30		$15,000	$10,000
Mound Branch Watershed Evaluation and Restoration Project	Osage Valley RC & D Council	C9007407-10 C9007407-14	2013/06/30	$150,000	$48,830	$56,797
Demonstration Integrated Water Management Systems (WMS) for Improved Water Quality (WQ) Project	University of Missouri Columbia	C9007407-10 C9007407-12	2012/01/15		$285,933	$190,622
Active Project Award TOTALS				**$8,729,788**	**$5,363,146**	**$7,882,103**

Among these active projects, twenty new projects were awarded competitive or noncompetitive 319 nonpoint source program funding. The assortment of new projects for FY2012 includes those specific to outreach, education, implementation, monitoring, or various combinations. A summary of the project added in 2012 is provided below, which includes project name, start date, federal award, identification number, and recipient type.

Table 10: FFY 2012 New Subgrant/Minigrant Awards

Recipient	Project Name	Start Date	Award Amount	ID Number	Recipient Type
USGS-Water Resource Division/yr20	Ambient WQ Monitoring Network	2011/10/01	$842,308	AOC01380111B	Government
Columbia Housing Authority	Mid-Missouri Water Safety Project	2011/12/01	$8,000	G11-NPS-23	Government
Missouri State University	Ozarks Springs-Bull Shoals Field Station Project	2012/01/01	$6,913	G11-NPS-24	Educational
SWCD Greene County	Asher Creek 319 Project	2012/02/01	$134,186	G12-NPS-02	Government
James River Basin Partnership	Middle and Upper James River Show-Me Yards, Neighborhoods, Farms and Ranches	2012/03/01	$353,506	G12-NPS-03	Nonprofit
Northeast RC & D Council	Black Creek Watershed Management Plan	2012/03/01	$30,000	G12-NPS-08	Government
St. Louis Earth Day	St. Louis Earth Day Symposium	2012/03/01	$10,000	G12-NPS-09	Nonprofit
Missouri Stream Team Watershed Coalition	Water Watch Week	2012/03/15	$15,000	G12-NPS-11	Nonprofit
University of Missouri-Columbia	MU Hinkson Creek Watershed Assessment of BMPs for WQ Improvements and Effectiveness	2012/04/01	$253,800	G12-NPS-01	Educational

Jasper County Commission	Spring River WMP Implementation	2012/04/15	$331,068	G12-NPS-04	Government
SWCD Scotland County	Pride of Stride Project	2012/04/15	$10,000	G12-NPS-14	Government
Immanuel Lutheran School	Immanuel Rain Gardens for Clean Streams Project	2012/04/15	$5,770	G12-NPS-12	Educational
Lake Area Industries	Gifted Garden Implementation and Ed Project	2012/05/01	$10,000	G12-NPS-10	Nonprofit
City of Branson	Branson Storm Drain Marking Program to Reduce NPS Pollution	2012/05/01	$3,819	G12-NPS-13	Government
USGS - Missouri Water Science Center	Investigation of E. coli at Lake Ozark	2012/05/14	$42,700	AOC13380019	Educational
USGS - Water Resource Division	Investigation of E. coli at Lake of Ozarks State Parks Beaches & Monitoring at Pomme De Terre State Park	2012/05/14	$102,300	AOC13380018	Government
Missouri Coalition for the Environment	Keifer Creek Watershed Management Plan	2012/07/01	$30,000	G12-NPS-07	Nonprofit
Meramec Regional Planning Commission	Partnership for Cleaner Water through Illegal Dump Cleanup, Education and Community Involvement	2012/09/01	$10,000	G13-NPS-03	Government
Missouri Stream Team Watershed Coalition	Mill Creek Nonpoint Source Pollution Education and Engagement Program	2012/09/01	$10,000	G13-NPS-04	Nonprofit
SWCD Schuyler County	Well Decommissioning	2012/09/15	$10,000	G13-NPS-05	Government
	Total		**$2,219,370**		

Other Activities of the 319 Program Staff

Some staff funded through the 319 program are responsible for promoting, implementing, and reporting progress of subgrant projects. Staff also perform activities not directly associated with a grant project such as providing input and direction on a wide variety of water quality related issues that are priorities for the Department. Staff serve on multiple workgroups and committees to help address issues which may include, but are not limited to, wetlands, forest management, lake monitoring, abandoned mine lands, animal waste handling, urban and stormwater runoff, TMDLs, mercury contamination, abandoned landfills, pesticide and nutrient planning, general agriculture, sand and gravel mining, watershed planning, source water protection, wellhead protection, State Revolving Fund (SRF) NPS on-site systems, and Missouri Stream Teams.

Staff participate in conferences and meetings, giving presentations as requested, and setting up displays at a variety of venues throughout the state to provide awareness about 319 NPS grant opportunities and disseminate information to those interested in addressing NPS problems.

IV. Other Department Nonpoint Source Water Quality Accomplishments

The Department programs listed in this section work in conjunction with the Nonpoint Source Program and can impact nonpoint sources and influence 319 projects either through shared funding to assist the projects, by providing information for watershed management plans, or by assisting in evaluating outcomes of 319 projects.

A. Soil and Water Conservation Program - Agricultural NPS SALT Program, State Cost Share, and Mississippi River Basin Healthy Watershed Initiative (MRBI)

The Soil and Water Conservation Program (SWCP) works with Soil and Water Conservation Districts to complete goals targeting Agriculture Nonpoint Source pollution through Cost-Share practices. Currently, there are forty-three practices listed within the Cost-Share Docket that landowners may implement with approval of the local SWCD Board. Cost-Share provides an incentive to landowners implementing practices by reimbursing 75% of the total practice cost. Landowners must complete the practices based on SWCP guidelines and fund the remaining 25% of the cost themselves. Soil and Water Conservation Districts set goals for each Resource Concern, determined by their Annual Needs Assessment. Goals are completed, using practices specific to those areas, and deemed most advantageous for completing district goals. Resource Concerns address TMDL through reduction of sedimentation and nutrient run-off.

The Governor signed House Bill 250 on June 26, 2009, which allowed water quality best management practices that were successfully implemented in the AgNPS SALT program to become available statewide. This expanded the number of conservation practices available statewide in Missouri. Consistent with a watershed –based approach, the table below provides the number of conservation practices cost shared, total tons of soil saved, that the total state cost share provided during FFY2012 for each of Missouri's sixty six HUC 8 watersheds.

The Agricultural Nonpoint Source (AgNPS) Special Area Land Treatment (SALT) Program has been discontinued. However, information on active and previously awarded projects can be accessed at: http://www.dnr.mo.gov/env/swcp/salt_overview.htm. Individual watershed goals and project descriptions may be viewed at that Web site.

Provided by funding through half of the 1/10th of one percent Parks and Soils Sales Tax of Missouri, the AgNPS SALT program was offered through the Department's Soil and Water Conservation Program. The program allowed county Soil and Water Conservation Districts (SWCDs) to direct technical and financial assistance to landowners with land identified and prioritized as having water quality problems, to address agricultural nonpoint sources of pollution. Success of these projects is dependent on the cooperation of numerous partners using a variety of tools to accomplish project goals.

Below is a list of the thirty-three AgNPS SALT projects that were active in FFY2012. Approximately $4,000,000 of regular cost-share funds will support these projects until 2015. Throughout the time period when SALT grants were awarded, 319 staff assisted with prioritizing SALT applications based upon watersheds having 319 activities. Also, during this time period the SALT Coordinator and 319 NPS Coordinator participated in both program's project reviews and selection.

Table 11. FY12 Active AgNPS SALT Projects

Project #	District	Project Name
SEVENTH CALL		
SN068	Barton	Little North Fork Spring Creek
SN070	Caldwell	Shoal Creek
SN071	Carroll	Big Creek
SN072	Dallas	Greasy Creek
SN074	Maries	Little Maries River
SN075	McDonald	Indian Creek
SN076	Mercer	Muddy Creek
SN077	Montgomery	Bear/Brush Creek
SN079	Scott	Ramsey Creek
SN080	Stoddard	Dexter Creek
SN081	Vernon	Osage Plains
SN082	Wright	Woods Fork / Gasconade River
EIGHTH CALL		
SN083	Benton	Lower Cole Camp
SN084	Clinton	Shoal Creek
SN085	Cole	Grays Creek
SN086	Macon	Middle Fork Salt River
SN087	Montgomery	Lower Loutre
SN088	Osage	Little Maries Creek
SN089	Pemiscot	Pemiscot Clay Root
SN090	Saline	Salt Fork Creek
SN091	Scott	St. Johns Bayou
SN092	Stoddard	Bess Slough
NINTH CALL		
SN093	Bollinger	Hurricane Creek
SN094	Cape Girardeau	Byrd Creek
SN095	Cass	Upper Big Creek
SN096	Dunklin	Crowley Ridge
SN097	Greene	Pearson Creek
SN098	Oregon	Warm Fork of Spring Creek
SN099	Pettis	Heaths Creek
SN100	Randolph	Elk Fork Coon Creek
SN101	Ray	Crooked River
SN102	Scotland	South Wyaconda
SN103	Webster	James River Lower Headwater
SN104	Wright	Clarks Creek

In addition to the SALT program, Missouri provides regular state cost share. A portion of the Parks and Soils Sales Tax is used for Missouri landowners that implement soil and water conservation practices, which are available through the state cost-share program. These practices conserve soil, which consequently improves water quality by reducing sedimentation in our rivers and streams. The practices reduce soil erosion by a variety of methods that may include increasing crop residue, improving vegetation, diversion or containment of water to facilitate slower release, protection of stream bank and forested areas from livestock, and reduction of wind erosion. Below is a summary of estimated soil saved by HUC 8.

Table 12. State Cost Share and Tons of Soil Saved

HUC 8	STATE COST SHARE	TONS OF SOIL SAVED	CONSERVATION PRACTICES (No.)	HUC 8	STATE COST SHARE	TONS OF SOIL SAVED	CONSERVATION PRACTICES (No.)
07100009	$24,750	3,000	3	10280202	$391,323	24,961	61
07110001	$520,751	36,546	73	10280203	$189,606	17,014	33
07110002	$680,894	26,233	110	10290102	$146,307	6,168	38
07110003	$420,013	21,756	51	10290103	$74,022	3,052	18
07110004	$405,778	32,388	69	10290104	$215,727	14,070	73
07110005	$463,133	31,697	61	10290105	$580,977	20,336	147
07110006	$810,376	100,499	154	10290106	$839,372	23,635	236
07110007	$272,757	24,111	55	10290107	$522,564	7,488	149
07110008	$946,601	32,647	180	10290108	$818,736	21,983	220
07110009	$18,324	0	3	10290109	$292,866	7,782	81
07140101	$52,269	1,750	19	10290110	$467,102	12,299	146
07140102	$528,176	16,212	152	10290111	$644,477	62,462	221
07140103	$215,411	3,838	80	10290201	$1,047,661	19,888	318
07140104	$173,638	2,445	61	10290202	$234,128	9,690	79
07140105	$604,311	29,616	273	10290203	$459,371	24,263	137
07140107	$576,698	44,719	182	10300101	$1,283,955	56,131	239
08010100	$9,793	930	2	10300102	$1,421,685	58,693	325
08020200	$4,871	420	4	10300103	$701,105	22,838	120
08020201	$275,520	72,630	100	10300104	$1,154,295	97,245	228
08020202	$286,884	12,550	74	10300200	$454,223	36,513	117
08020203	$236,592	51,810	73	11010001	$26,347	1,725	7
08020204	$1,532,911	636,763	504	11010002	$419,978	29,820	150
08020302	$42,717	2,320	11	11010003	$386,294	9,574	129
10240004	$51,451	6,258	4	11010006	$577,087	39,511	154
10240005	$875,701	125,794	94	11010007	$302,400	21,661	97
10240010	$537,946	38,687	77	11010008	$718,743	45,354	207
10240011	$162,676	12,828	29	11010009	$12,361	0	4
10240012	$994,258	52,721	155	11010010	$210,743	14,109	169
10240013	$325,940	22,740	49	11010011	$441,704	21,228	204
10280101	$2,017,983	131,815	326	11070206	$24,138	0	9
10280102	$727,109	38,943	121	11070207	$939,429	43,047	334

10280103	$1,245,698	68,512	200	11070208	$241,844	3,340	39
10280201	$255,340	10,787	60	**Grand Totals**	**$32,537,838**	**2,469,838**	**7,898**

B. Source Water Protection

Public Drinking Water information can be accessed at:
http://www.dnr.mo.gov/env/wpp/dw-index.htm

The Safe Drinking Water Act (SDWA) Amendments of 1996 require states to implement Source Water Assessment Plans (SWAP) to better protect public drinking water from contamination. These tasks include:

- Delineate source water areas
- Inventory significant potential sources of contamination
- Determine the susceptibility of each public water supply to contamination
- Make the results available to the public

There are 24 surface water community water supplies (CWS) in the state that had approved Source Water Protection Plans (SWPPs). There are 44 groundwater CWS in Missouri with approved SWPPs. Eight new SWPPs were approved in 2008. The total population served by the 68 approved SWPPs is 314,862 or about 6.3% of the state's population who are served by CWS. The Source Water Inventory Projects Web site http://drinkingwater.missouri.edu/swip/index.html provides information on source water assessment for Missouri's drinking water supplies.

The Public Drinking Water Branch, in association with the U.S. EPA and other partners, has an active program to reach out to community planners and civic leaders to educate and inform the citizens of Missouri about the importance and benefits of establishing SWPPs in their communities.

Further discussion and links to approved source water plan information are provided within the individual HUC 8 watershed pages.

CREP Overview

The Conservation Reserve Enhancement Program (CREP) is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water. The program is a partnership among producers; tribal, state, and federal governments; and, in some cases, private groups. CREP is an offshoot of the country's largest private-lands environmental improvement program - the Conservation Reserve Program (CRP).

Like CRP, CREP is administered by USDA's Farm Service Agency (FSA). By combining CRP resources with state, tribal, and private programs, CREP provides farmers and ranchers with a sound financial package for conserving and enhancing the natural resources of farms.

CREP addresses high-priority conservation issues of both local and national significance, such as impacts to water supplies, loss of critical habitat for threatened and endangered wildlife species, soil erosion, and reduced habitat for fish populations such as salmon. CREP is a community-based, results-oriented effort centered around local participation and leadership.

C. Total Maximum Daily Load (TMDL) Development

Under the federal Clean Water Act, the TMDL program provides a framework for restoring impaired waters. Section 303(d) of the Act requires states to identify and list all waters that are failing to meet the state's water quality standards. These are waters that remain impaired even after existing regulatory and permitting requirements have been put in place. The state is required to develop a TMDL for each water body on the 303(d) List of impaired waters. The state's 303(d) List is revised and updated every two years and requires approval from the U.S. Environmental Protection Agency. Missouri's most recently approved 303(d) List can be viewed on the Department's website at http://dnr.mo.gov/env/wpp/waterquality/303d.htm.

Developing a TMDL is a water quality-based process. A TMDL is a mathematical calculation of the maximum amount of a specific pollutant that a water body can absorb and still meet water quality standards. TMDLs identify the potential or suspected pollutant sources in a watershed and distribute the allowable pollutant loads among these various sources.. A small portion of the allowable pollutant load is also reserved as a margin of safety to account for any uncertainties in scientific or technical understanding of water quality in natural systems. A TMDL must also address seasonality to ensure the pollutant loading allocated will be protective at all applicable times. Strategies and recommendations to protect or restore water quality and achieve the impaired waters' designated uses are included in a TMDL or in a supplemental TMDL implementation plan. All Missouri TMDLs are placed on a 45-day public comment period. Comments received are addressed with a written response, and the TMDL is amended as appropriate. Completed TMDLs are then submitted to EPA for approval.

From 1999 through September 30, 2012, 240 water body/pollutant pairs have had a TMDL or a permit-in-lieu of a TMDL completed and approved, or were delisted due to meeting water quality standards or being placed in a category that does not require a TMDL.

Information contained in a TMDL document includes:

- Location of the impaired water body.
- Identification of the pollutant(s).
- Potential sources of the pollutant(s).
- A calculation of the pollutant load that the water body can assimilate without becoming impaired.
- A plan to reduce the existing pollutant load and restore the water body to meet the standards for its designated use.

TMDLs are designed to include and address nonpoint sources of pollution, which occur when runoff from rainwater, snowmelt, and crop irrigation carries pollutants into the water. If the source of the pollutant is solely due to a specific point source (e.g., a wastewater treatment plant), then a permit-in-lieu of a TMDL may be submitted to EPA.

Additional information on approved TMDLs and those in progress can be viewed at the following Web site: http://www.dnr.mo.gov/env/wpp/tmdl/index.html.

D. Hazardous Waste Program (Superfund Sites)

In 1980, the U.S. Congress established the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), better known as Superfund. This law was passed in response to the indiscriminant disposal of the by-products of industrial life, which contaminated soil and water, resulting in threats to public health and the environment. The federal law provided both response and funding mechanisms for the cleanup of hazardous substance disposal sites. The Superfund Section is designed to clean up contaminated property where releases of hazardous substances have occurred in the past or are threatening to occur due to past practice. The federal law requires the past polluters, called responsible parties, to pay for the cleanup. The Missouri Department of Natural Resources, Superfund Section has responsibility for many of these sites.

National Priorities List Sites (NPL)
http://www.epa.gov/region07/cleanup/npl_files/index.htm

- Annapolis Lead Mine, Iron County
- Armour Road, Clay County
- Bee Cee Manufacturing Co., Dunklin County
- Big River Mine Tailings/St. Joe Minerals Corp., St. Francois County
- Compass Plaza Well TCE, Greene County
- Conservation Chemical Co., Jackson County
- Ellisville Site, St. Louis County
- Fulbright Landfill, Greene County
- Lake City Army Ammunition Plant (Northwest Lagoon), Jackson County
- Lee Chemical, Clay County
- Madison County Mines, Madison County
- Minker/Stout/Romaine Creek, Jefferson County
- Missouri Electric Works, Cape Girardeau County
- Newton County Mine Tailings, Newton County
- Newton County Wells, Newton County
- Oak Grove Village Well, Franklin County
- Oronogo-Duenweg Mining Belt, Jasper County
- Pools Prairie, Newton County
- Quality Plating, Scott County
- Riverfront, Franklin County
- Solid State Circuits, Inc., Greene County
- Southwest Jefferson County Mining, Jefferson County

- St. Louis Airport/Hazelwood Interim Storage/Futura Coatings Co., St. Louis County
- Syntex Facility, Lawrence County
- Valley Park TCE, St. Louis County
- Vienna Wells, Maries County
- Washington County Lead District - Furnace Creek, Washington County
- Washington County Lead District - Old Mines, Washington County
- Washington County Lead District - Potosi, Washington County
- Washington County Lead District - Richwoods, Washington County
- Weldon Spring Former Army Ordnance Works, St. Charles County
- Weldon Spring Quarry/Plant/Pits (USDOE/ARMY), St. Charles County
- Westlake Landfill, St. Louis County

Proposed Sites

- No currently proposed sites

E. Land Reclamation Program

http://www.dnr.mo.gov/env/lrp/index.html

Historically, nearly 67,000 acres have been left unreclaimed by coal-mining operations, and an estimated 40,000 acres were left abandoned through the mining of other commodities. Missouri was left with acid mine drainage, dangerous high walls, hazardous water bodies, open wells and mine shafts, barren mine spoils, coal waste, soil erosion, stream sedimentation, and channelized streams.

The Land Reclamation Program plays an integral role in protecting and preserving Missouri's land and water resources. The program is responsible for regulating today's mining industry and for correcting health, safety and environmental problems associated with abandoned mines. When properly reclaimed, the land can once again be used as for a variety of uses, including agricultural and wildlife areas. Wildlife habitat remains a key concern of the Land Reclamation Program. Whenever possible, abandoned mines are reclaimed with native prairie grasses, trees, and mitigation waters and wetlands that are part of Missouri's history. Of primary importance to this report is that reclaiming abandoned mine land (AML) protects the environment by preventing or mitigating toxic or acid mine drainage, groundwater contamination and acid-sediment runoff from soil erosion.

In addition to coal mine reclamation, the program has been approved to use funds to close lead and zinc mine shafts throughout the state but primarily in southwest Missouri. During this period, one additional abandoned mine shaft was closed to the benefit of groundwater quality in the lead/ zinc regions.

Highland Highwall Abandoned Mine Land Project: In September 2011, Walters Excavating, LLC, of Lowry City, Missouri, was given Notice to Proceed for the Highland Highwall Reclamation Project. The project is located in portions of the SW ¼ SW ¼ of Section 35, T43N, R25, SE ¼ SE ¼ of Section 34, T43N, R25 W, and NW ¼ NE ¼ of

Section 3, T42N, 25W (Calhoun West, MO 7.5' Quadrangle Map 1954) in Henry County. This project reclaimed approximately 85 acres of an abandoned coal mine which was surface mined by Peabody Coal Company. Mining activities commenced in 1965 and continued no later than 1974. When mining activities ceased, more than 50 depressions or pits that ranged in size of several acres to less than 100 feet were left on the property.

The major safety concern was to eliminate an extremely dangerous 3,600 feet highwall that was located immediately adjacent to a county gravel road. Additionally, dangerous and poorly vegetated spoil piles were graded and revegetated to create more suitable pastureland. Several hazardous water bodies had been drained and backfilled. All excavation activities have been completed, the site has been seeded, and all disturbed areas have been mulched to control erosion.

On May 2, 2012, the Highland Highwall Reclamation Project was deemed "Substantially Complete. The work was finished well before the proposed contract completion date of June 28, 2011. The total final cost for this project was $424,353.53.

Montrose Badlands Reclamation Project: In May 2011, the Missouri Land Reclamation Program authorized construction on the Montrose Badlands AML Reclamation Project. The Montrose Badlands Project is located approximately 3 miles Northwest of Montrose, Missouri, in the W ¼ of Section 11, T40N, R28W, in Henry County, Missouri (Johnstown, MO 7.5' Quad). This project was composed of a high priority dangerous highwall and dangerous spoil piles and embankments that had been actively eroding since the mining operations ceased in the 1960's.

The project site was composed of 35 acres of sparsely vegetated and eroding mine spoil piles, 700 feet of dangerous highwall located adjacent to County Road SW1300, a breached sediment pond that was discharging poor quality water and sediments into waters of the United States, and 3 small acid water ponds that provided poor quality water to a cattle grazing operation. Prior to reclamation, the site was sparsely to moderately vegetated with volunteer cedar, sycamore, cottonwood, various oak, black locust, dogwood, sumac, honeysuckle, various weed species, and assorted grazing material. The grass species located on-site was of moderate quality, with some areas being sparsely vegetated or barren. The project consisted of excavating and burying coal waste; clearing, grubbing, and grading the site; and incorporating significant amounts of lime to treat the extremely acidic spoil materials. Additionally, acid-forming sediments associated with the breached sediment pond were covered and buried to encapsulate and prevent the material from leaving the site. To replace the lost water bodies, a dam was constructed across an existing pit to increase the depth of the water and create viable fish and wildlife habitat.

The completed reclamation project will be seeded with two green cover crops in efforts to add organic matter for development of sustainable living soils. A permanent seeding of a cool season grass and legumes was planted in the fall of 2012. Upon final grading, the reclamation area was treated with a heavy application and incorporation of lime to

mitigate the extremely acidic spoils, and the areas were then fertilized and seeded to control erosion and sediment runoff. A total of 26.3 acres were seeded to a warm season grass mix and an additional 48.7 acres were seeded to a cool season grass mix. Some of the areas seeded have been extremely stressed due to the excessive heat and prolonged dry period this summer, along with some of the plantings being completed outside of the optimum recommended seeding dates. The final cost of construction was $436,687.68.

Lester Davis Reclamation Project: On May 23, 2012, the Missouri Office of Administration issued Double S Dirt Work, Inc., an "intent to award" followed by notice to proceed on June 12, 2012. The areas of reclamation are located within the Missouri Department of Conservation's Lester Davis Memorial Forest, which is owned and managed by the Missouri Department of Conservation, and the surrounding landowners in the N ½ of Section 29, T23N, R33W, and the W ½, N ¼ of section 28, T32N, R33W, in Barton County, Missouri (Liberal, MO 7.5 minutes Quadrangle Map). This 38-acre project eliminated the health and safety concerns associated with several highwalls, dangerous piles and embankments, hazardous water bodies of an abandoned surface coal mining operation. Mining activities ceased sometime prior to 1951, when the tree plantings began on the Lester Davis property.

On October 10, 2012, the Lester Davis Reclamation Project was deemed "Substantially Complete." All construction activities have been completed and all of the critical work including backfilling the highwalls and pits has been done. Additionally, the LRP staff worked with the Office of Surface Mining to characterize the water quality of the site to determine the potential for acid mine drainage mitigation and riprap swales were constructed early in the project to serve as sediment control structures. The overall grade of the site has been approved and the lime has been applied and incorporated into the soil. The work was finished well before the proposed contract completion date of November 14, 2012.

Two change orders for a total additional $8500.00 was added to the contract. The additional cost included installing a road culvert along the county gravel road, the placement of additional fill in an existing pit for improved access, installing a fence to restrict unauthorized vehicles from entering Lester Davis State Forest, and a payment to the local county fire district to provide fire protection during the burning of cleared trees and brush materials. Upon completion, the site was seeded with a green cover crop to add organic matter to the developing soil and mulched to control erosion. A total of 38 acres will be seeded at a later date with a mixture of cool and warm season grasses. The final cost of construction was $460,553.93.

Webb City Elks Lodge Lead/Zinc Shaft Reclamation Project: On February 7, 2012, Emery Sapp & Sons DBA/Kennedy-ESS Contractors, of Springfield, Missouri, completed reclamation of the Webb City Elks Lodge Shaft. The project site is located on private property in Webb City, Missouri in Jasper County. The project consisted of closing a priority 1 abandoned underground lead/zinc mine shaft that had opened up in a wooded area directly behind the Webb City Elks Lodge and immediately adjacent to a residential subdivision. Reclamation of the project entailed construction of a steel-

reinforced concrete plug that bridged over the opening and rested on bedrock. Upon curing of the concrete plug, the sealed shaft was backfilled to the surface using fill material excavated from around the opening and chat material hauled in from a nearby off-site borrow source. Work began on January 30, 2012 and was deemed complete on February 7, 2012. A MDNR monument marker was installed at the center of the filled shaft surface to mark the location of the shaft. Excavation of the opening revealed that the actual shaft was significantly larger than that estimated; hence a change order in the amount of $2440.74 was approved to cover the additional cost of rebar and concrete. The total final cost of the project was $19,656.74.

F. Financial Assistance Center and State Revolving Fund

State Revolving Fund (SRF) information can be found at: http://www.dnr.mo.gov/env/wpp/srf/. The State Revolving Fund (SRF) provides low-interest loans to communities for wastewater and drinking water infrastructure projects. Projects may be new construction or the improvement or renovation of existing facilities. Few of the following program individual awards are directly associated with 319 NPS subgrants; however, the Financial Assistance Center and State Revolving Fund perform NPS related activities that contribute to Missouri's overall NPS control efforts. Various programs are listed below.

NPS Animal Waste Disposal Loan Program
This is a nonpoint source loan program designed to provide low interest financing to small producers for design and construction of animal waste treatment facilities. http://www.dnr.mo.gov/env/wpp/srf/cwsrf-animal-loans.htm

NPS Neighborhood Improvement Loans
The SRF may finance neighborhood improvement projects if the project is a benefit to water quality and the problem is addressed in Missouri's NPS Management Plan. The Neighborhood Improvement District Act, adopted by the Missouri General Assembly in 1990, provides a framework for political subdivisions of the State to issue general obligation bonds upon a 100% petition or a majority vote (4/7 in general, municipal, or primary elections; 2/3 in special elections) of the residents in an area to form a neighborhood improvement district (NID). These projects were the result of a cooperative effort between a city, county, sewer district and the residents within a proposed neighborhood improvement district. The city/county/district's role was to coordinate efforts and provide engineering, inspection, and financial support. Individual members of the NID were given the choice to pay for the improvement in a lump sum or through special property tax assessments. Projects are financed for 10 to 20 years.

Brownfields Redevelopment
SRF monies may be loaned for Brownsfields Redevelopment if the project can result in a benefit to local water quality and if the category of problem is identified in Missouri's NPS Management Plan. The SRF funds can be used in conjunction with a number of other state and federal funding sources to affect the clean-up of a "Brownfields" site, underutilized or abandoned, contaminated, industrial property. The Department of

Natural Resources' Voluntary Cleanup Program provides technical oversight for Brownfield remediation. Additional financial incentives (tax rebates or credits) can be obtained through the Missouri Department of Economic Development's Brownfield Redevelopment Program.

NPS Loan Programs and Projects

The Financial Assistance Center (FAC) has completed development of the Missouri On-site Loan Program (MOLP). The Department has approved the implementation two (2) limited pilot projects. The MOLP provides an interest subsidy on conventional financing for the purpose of resolving ongoing pollution issues resulting from failing on-site systems. The FAC will continue to consider other eligible projects for financing through the SRF. Projects such as agriculture best management practices, protection of wetlands and riparian corridors, landfill closures, and others are examples of potentially SRF eligible NPS projects. Loan recipients for SRF-NPS projects may be governmental, private sector entities, or individuals if the project is a benefit to water quality and the problem is addressed in Missouri's Nonpoint Source Management Plan.

Clean Water Act (CWA) Section 604(b)

CWA section 604(b) requires each state to receive 1% of the Clean Water SRF grant to carry out planning under the CWA section 205(j) and 303(e). Under CWA section 205(j)(3), each state must allocate at least 40% of its Clean Water Act section 205(j) grant to regional public comprehensive planning organizations or appropriate interstate organization.

FY2012 Section 604(b) Projects:

1. Lower Meramec River Water Quality, Green Infrastructure and Watershed Management G10-ARRAWQ-02
2. Green Infrastructure Concept Plan-MetroGreen G10-ARRAWQ-03
3. Upper Mississippi River Clean Water Act Planning and Coordination G10-ARRAWQ-01

G. Water Quality Standards/Monitoring/Assessment

Water Quality Monitoring, Assessment, and Standards can be found at: http://www.dnr.mo.gov/env/wpp/waterquality/

Water Quality Monitoring

The Department monitors water quality to:

- characterize background or reference water quality conditions;
- better understand daily, flow-event, and seasonal water quality variations and their underlying processes;
- characterize aquatic biological communities and habitats and to distinguish between the impacts of water chemistry and habitat quality;
- assess time trends in water quality;

- characterize the impacts of regional and local point and nonpoint source discharges on water quality;
- check for compliance with water quality standards or wastewater permit limits and monitor the effectiveness of pollution control activities; and
- support development of strategies to return impaired waters to compliance with water quality standards.

The Department released an updated version of the Missouri Water Quality Report, also called the 305(b) Report, in FY10. The complete document can be viewed at the following URL: http://www.dnr.mo.gov/env/wpp/waterquality/305b/index.html

The Department also funds seventy-two USGS long-term monitoring stations. In 2011, $136,251 of 319 funds was used in support of these monitoring stations. The Department used an additional $1,169,659 from other sources to support those USGS monitoring stations. Much of this data is made available on the Internet at: http://mo.water.usgs.gov/

Water Quality Standards

Information on Missouri's water quality standards can be found at: http://www.dnr.mo.gov/env/wpp/wqstandards/index.html

The objective of the Clean Water Act of 1972 along with its amendments are to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The first national set of water quality standards were published in 1983 and codified in 40 CFR Part 131. These regulations allow individual states to construct their own water quality standards framework providing there is no reduction in protection compared to federal guidelines.

Water Quality Standards are to be reviewed and modified every three years. Termed the triennial review process, coordinators with the Missouri Department of Natural Resources meet with the U.S. EPA, other state agencies, and concerned citizens to evaluate the effectiveness of our standards.

Water quality standards provide a means by which attainment of water quality objectives can be measured. The objective is protection of designated uses through the application of narrative or numeric criteria http://www.dnr.mo.gov/env/wpp/wqstandards/wq_criteria.htm. The level of protection given to a stream, lake, or river is dependent on the expected or "designated use(s)," of that water. Classified waters in Missouri have been assigned the designated uses that are listed in 10 CSR 20-7.031(c). The Antidegradation section requires actions to maintain existing uses.

Attainment frequency of water quality standards are used in identifying and characterizing waters of the state for purposes of compiling the 303(d) list and 305(b) report. In addition, effluent limits contained in National Pollution Discharge Elimination

System (NPDES) permits are frequently derived using water quality standards. http://www.dnr.mo.gov/env/wpp/permits/

During FY 2010 the Department initiated the 2012 triennial review of Missouri's Water Quality Standards (WQS) regulation at 10 CSR 20-7.031. The purpose of the 2012 WQS triennial review is to address federal and state program priorities, such as applying "fishable/swimmable" use designations to currently unclassified waters, improve the ability of the Department to offer variances and schedules of compliance, and other revisions that make the state rule functionally equivalent to federal standards.

H. Environmental Services Program (ESP)

The Water Quality Monitoring Section (WQMS) of the ESP takes part in the important effort of the Department of Natural Resources to ensure that Missourians will always have clean water for drinking, recreation, tourism, and continued economic growth. Staff travel to all areas of the state conducting a variety of investigations. These investigations routinely include monitoring wastewater discharges, groundwater monitoring, electro fishing and stream surveys. The WQMS often assists with special projects such as enforcement actions, environmental risk assessments, or damage assessments resulting from chemical spills. The staff are responsible for and possess the expertise to collect and evaluate a wide variety of water, sediment, and macroinvertebrate samples. The results of these studies are used to ensure that the rivers, streams, and lakes of Missouri remain a treasure for all to enjoy. (From ESP web page.)

More information on the ESP can be obtained from their Web site, http://www.dnr.mo.gov/env/esp/ and at http://www.dnr.mo.gov/env/esp/esp-wqm.htm

The above link does not specify the work that was conducted, but there are established QAPPs that can be referenced to determine specifically what work has been done by ESP.

IV. Agency Partnerships

Partner agencies' impact on NPS pollution is critical to nonpoint source programs. Both technical and financial assistance is available from various other state agencies to address nonpoint source pollution. This section highlights the many significant contributions that some of our other agency partners made in 2012.

A. Natural Resources Conservation Service (NRCS)
http://www.nrcs.usda.gov/

The Missouri 319 NPS program frequently partners or participates in various NRCS activities. Collaboration takes place at the state and national levels through the State Technical Committee, Mississippi River Basin Initiative, and National Water Quality Initiative. At watershed scale, though not always directly associated with 319 priority

watersheds, NRCS provides Environmental Quality Incentive Funds for soil and water quality management.

NRCS puts nearly 70 years of experience to work assisting America's private landowners with conserving their soil, water, and other natural resources. Local, state and federal agencies and policymakers also rely on their expertise. NRCS delivers technical assistance based on science and is suited to a customer's specific needs. Cost-share and financial incentives are available in some cases.

NRCS offers voluntary programs to eligible landowners and agricultural producers to provide financial and technical assistance to help manage natural resources in a sustainable manner. Through these programs the agency approves contracts to provide financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land.

The many technical and financial assistance programs provided by NRCS include the following that are especially pertinent to NPS remedial efforts:

- The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years in length.
- The Wetlands Reserve Program (WRP) offers landowners the opportunity to protect, restore, and enhance wetlands on their property. NRCS provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection.
- The Conservation Reserve Program (CRP) reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filter strips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices.

NRCS and partner achievements for FFY2012 through WRP and CRP are described in the tables below. EQIP program values for Missouri were unavailable for this report.

Table 13. Conservation Program Practice Summary

Conservation Practice Summary of the Wetland Reserve Program (WRP), the Conservation Reserve Program (CRP), and the Environmental Quality Incentive Program (EQIP) in Missouri. Source: Integrated data for enterprise analysis, Program Reporting System, and ProTracts USDA-REAP Division Certified October 1, 2011 – September 30, 2012							
Conservation Practice	U of Measure	WRP		CRP		EQIP	
		Practice Count	Amount Applied	Practice Count	Amount Applied	Practice Count	Amount Applied
314 Brush Management	ac			1	18.1	48	606
327 Conservation Cover	ac	7	83	3,489	44,926	177	3,555
328 Conservation Crop Rotation	ac			15	285	1,271	40,387
329 Residue and Tillage Management NoTill/Strip Till	ac			15	288	227	7,737
338 Prescribed Burn	ac			6	48	120	2,181
340 Cover Crop	ac			5	112	151	5,794
342 Critical Area Planting	ac	37	76	91	155	82	105
356 Dike	ft	12	26,666	1	1,836		
380 Windbreak Shelterbreak	ft			1	3,631	6	3,585
382 Fence	ft			16	14,127	830	1,633,627
386 Field Border	ac			55	3,754	6	26
390 Riparian Herbaceous Cover	ac			16	33	1	12
391 Riparian Forest Buffer	ac	7	43	88	418	3	26
393 Filter Strip	ac			178	544		
410 Grade Stabilization Structure	no			2	2	14	15
430 Irrigation Pipeline	Ft					82	74,501
412 Grass Waterway	Ac			129	119	24	24
449 Irrigation Water Management	Ac					457	24,275
464 Irrigation Land Leveling	Ac					144	6,578
472 Access Control	ac			1,839	22,547	357	13,575
484 Mulching	ac			8	5.9	1	1
490 Tree and Shrub Site Prep	ac	16	151	2	3	10	33
511 Forage Harvest Management	ac			263	8,860	228	5,968
512 Forage & Biomass Planting	ac			1	6	428	6,895
516 Livestock Pipeline	ft			3	1,400	390	433,315
528 Prescribed Grazing	Ac					2,747	51,332
533 Pumping Plant	No					51	51
554 Drainage Water Management	ac					30	1,365
560 Access Road	ft					2	761
561 Heavy Use Area Protection	Ac					86	90
578 Stream Crossing	no			2	2	13	14
587 Structure for Water Control	no	28	31	2	5	9	2129
590 Nutrient Management	ac			45	542	1133	30,984
595 Integrated Pest Management	ac			73	558	636	18,496
600 Terrace	ft					225	844,141
612 Tree & Shrub Establishment	ac	17	151	69	556	15	41
614 Watering Facility	no			3	3	509	654
620 Underground Outlet	ft			2	605	205	379,480
638 Water & Sediment Control Basin	no			2	3	44	1,830
642 Water well	no			2	2	43	289
643 Restoration of Rare & Declining Habitat	ac			47	419	86	1,878
644 Wetland Wildlife Habitat Management	ac	90	1,534	24	299	2	5
645 Upland Wildlife Habitat Management	ac	11	92	1,396	12,189	369	5,153

646 Shallow Water Development & Management	ac	3	53	4	35	22	1,009
647 Early Successional Habitat Development/Mngt	ac	2	188	69	267	6	119
648 Wildlife Watering Facility	no			1	1		
657 Wetland Restoration	ac	161	3,185	15	163	1	3
658 Wetland Creation	ac	3	74				
659 Wetland Enhancement	ac	100	4,642	1	9		
666 Forest Stand Improvement	ac	1	21	3	24	181	3,223
798 Seasonal High Tunnel System	Ft2					55	113,036
799 Monitoring and Evaluation	no					28	28

Table 14. Conservation Practices by Watershed

Conservation Practice Summary of Selected Federal Programs in Missouri by Watershed Source: Integrated data for enterprise analysis (IDEA) and ProTracts, USDA – REAP Division Certified October 1, 2011 – September 30, 2012			
Watershed	Number of Conservation Practices in FY12 Meeting a NRCS Standard and Specification		
	Wetland Reserve Program (WRP)	Conservation Reserve Program (CRP)	Environmental Quality Incentives Program (EQIP)
07100009 Lower Des Moines	0	14	0
07110001 Bear-Wyaconda	52	196	64
07110002 North Fabius	0	536	228
07110003 South Fabius	20	224	79
07110004 The Sny	39	141	249
07110005 North Fork Salt	36	358	142
07110006 South Fork Salt	51	283	188
07110007 Salt	0	231	161
07110008 Cuivre	0	144	288
07110009 Peruque-Piasa	0	17	5
07140101 Cahokia-Joachim	0	0	42
07140102 Meramec	0	8	346
07140103 Bourbeuse	0	1	157
07140104 Big	0	0	210
07140105 Upper Mississippi – Cape Girardeau	0	36	156
07140107 Whitewater	0	45	209
08010100 Lower Mississippi-Memphis	1	0	2
08020201 New Madrid – St. Johns	2	44	116
08020202 Upper St. Francis	0	0	81
08020203 Lower St. Francis	31	2	106
08020204 Little River Ditches	15	5	627
08020302 Cache	0	0	77
10240004 Nishnabotna	0	0	7
10240005 Tarkio-Wolf	4	115	149
10240010 Nodaway	0	135	53
10240011 Independence – Sugar	0	33	103
10240012 Platte	0	561	238
10240013 One Hundred and Two	0	19	19
10280101 Upper Grand	9	941	741

10280102 Thompson	5	55	34
10280103 Lower Grand	10	1132	439
10280201 Upper Chariton	5	57	98
10280202 Lower Chariton	39	110	20
10280203 Little Chariton	5	82	66
10290102 Lower Marais Des Cygnes	20	82	70
10290103 Little Osage	3	35	31
10290104 Marmaton	2	88	61
10290105 Harry S. Truman Reservoir	1	51	196
10290106 Sac	12	73	671
10290107 Pomme De Terre	0	8	63
10290108 South Grand	24	364	501
10290109 Lake of the Ozarks	0	15	129
10290110 Niangua	0	0	169
10290111 Lower Osage	0	8	166
10290201 Upper Gasconade	0	0	374
10290202 Big Piney	0	1	249
10290203 Lower Gasconade	0	34	124
10300101 Lower Missouri - Crooked	20	389	333
10300102 Lower Missouri-Moreau	0	516	428
10300103 Lamine	12	201	386
10300104 Blackwater	49	541	120
10300200 Lower Missouri	0	79	469
11010001 Beaver Reservoir	0	0	3
11010002 James	0	0	252
11010003 Bull Shoals Lake	0	0	208
11010006 North Fork White	0	0	154
11010007 Upper Black	0	0	97
11010008 Current	0	1	282
11010009 Lower Black	0	0	26
11010010 Spring	0	0	65
11010011 Eleven Point	0	3	172
11070206 Lake O' The Cherokees	0	0	11
11070207 Spring	25	211	649
11070208 Elk	0	5	81
Totals	495	8230	12,040

Mississippi River Basin Healthy Watersheds Initiative (MRBI) Projects and Tier 1 Edge-of-Field Water Quality Monitoring in Missouri

The U.S. Department of Agriculture – Natural Resources Conservation Service (NRCS) is allocating up to $80 million in financial assistance each year over a four-year period from federal fiscal years 2010 through 2013 for the Mississippi River Basin Healthy Watersheds Initiative (MRBI). A total of 13 states including Missouri are eligible to submit project proposals for MRBI funds. MRBI is not a grant program. Federal funding is provided for conservation cost-share to producers through a volunteer, incentive-based initiative. MRBI works with conservation partners to address nutrient and sediment loading, which have contributed to local water quality problems and hypoxia in the

northern Gulf of Mexico. NRCS is working with producers using a conservation systems approach to manage and optimize nitrogen and phosphorus within fields, reduce runoff and downstream nutrient loading, improve water quality, restore wetlands, and enhance wildlife habitat while maintaining agricultural productivity. Eligible six 8-digit HUC watersheds in Missouri include: Lower Grand, North Fork Salt, South Fork Salt, Little River Ditches, Lower St. Francis, and Cache Creek.

In June 2012, Missouri was awarded MRBI funding for all four of its project proposals. Missouri and Iowa tied for the second-most projects funded behind Arkansas's nine projects. If Missouri's projects are fully funded, they will receive $7.6 million over the next four years. In 2011, Missouri was awarded MRBI funding for six MRBI projects, the most of any eligible state. If these projects are fully funded, they will receive $9.7 million from 2011-2015. In 2010, Missouri was awarded MRBI funding for 12 MRBI projects, the most of any eligible state. If these projects are fully funded, they will receive a total of $28.3 million from 2010-2015.

Key factors in Missouri's successful applications for MRBI funds from 2010-2012 have been the assistance provided by the Missouri Department of Natural Resources - Soil and Water Conservation Program (SWCP) to the county soil and water conservation districts (districts) in the preparation of their MRBI project proposals, the close working relationships between the districts and the Natural Resources Conservation Service's county offices, and SWCP's contributions of nonfederal matching funds and services-in-kind from the one-tenth-of-one-percent Parks, Soils and Water Sales Tax to the MRBI project proposals. Pledged state funds have included the estimated state cost-share payments that will be provided to producers within each MRBI project area during the project period and estimated state cost-share payments to producers for edge-of-field and in-field water quality monitoring practices, and state funds provided to the U.S. Geological Survey for installing gaging stations and water quality monitoring of stream sites in the six MRBI project areas in the Lower Grand watershed. The leveraging of these state funds will bring up to $45.6 million in additional federal cost-share funds into the state of Missouri from 2010-2016. These funds will be beneficial to Missouri's environment and its economy. The estimated economic benefits to the state of Missouri from $45.6 million in additional federal cost-share include:

- Additional private investments of $15.2 million (25% cost-share required by producers) combined with the $45.6 million in federal MRBI funds for a total public and private investment of $60.8 million.
- Estimated total business sales of $77.5 million.
- Creation of over 150 jobs each year during the four-year project periods.
- Estimated $12.2 million in labor income.
- Estimated $16.7 million in property-type income.
- Estimated $2.1 million in indirect business taxes for local and state governments.
- Total value-added economic benefits of $31 million after adjusting for the public and private investments of $60.8 million from 2010-2016.

Conservation practices for the MRBI projects in Missouri were selected based on the soil and water conservation district annual needs assessments and NRCS priorities which are

based on identification of "at risk" acres and "acres needing treatment" for each resource concern within the project areas. The most common conservation practices being implemented within the Lower Grand, North Fork Salt, and South Fork Salt watersheds include: terraces, cover crops, field borders, nutrient management, filter strips and riparian forest buffers along stream corridors. The most common practices being implemented within the Bootheel Area (Cache, Little River Ditches, Lower St. Francis watersheds) include: irrigation land leveling, irrigation underground pipeline, nutrient management, cover crops, irrigation water management, and shallow water development and management for wildlife. All of Missouri's 2010 and 2011 MRBI projects are actively implementing conservation practices. The 2012 MRBI projects began implementing conservation practices during the fall of 2012.

As of June 30, 2012, a total of 12 edge-of-field monitoring sites have been installed. An example of these monitoring sites are the two edge-of-field monitoring sites (one at a terrace bubble-up outlet and the other at the outlet of a wetland that is treating the runoff from the bubble-up outlet) that were installed in Livingston County as part of the Livingston and Carroll Lower Grand Watershed Project. Between six and eight additional edge-of-field monitoring sites were expected to be installed in 2012; however, there is currently a moratorium on these monitoring sites as NRCS completes standards and specifications for edge-of-field monitoring in order to obtain approval of this practice as an NRCS Conservation Activity. To encourage producers to sign up for edge-of-field monitoring, the Soil and Water Conservation Program is providing 25% cost-share payments to producers in conjunction with NRCS's 75% federal cost-share payments, so that producer's will not have any out-of-pocket expenses. Edge-of-field monitoring data is critically needed to document the effectiveness of conservation practices in reducing sediment and nutrient loading.

Rapid Watershed Assessments

"Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best actions to achieve their goals.

These assessments are conducted by watershed planning teams traveling through each watershed, meeting with landowners and conservation groups, inventorying agricultural areas, identifying conservation opportunities and current levels of resource management, and estimating impacts of these opportunities on the local priority resource concerns. While these rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost." (NRCS, RWA Website)

B. Missouri Department of Health and Senior Services

http://www.dhss.mo.gov/

The mission of the Department of Health and Senior Services (DHSS), Bureau of Environmental Health Services, and Bureau of Environmental Epidemiology are to

protect and promote quality of life and health for all Missouri citizens by developing and implementing programs and systems that provide:

1. Assessment services for environmental health conditions,
2. Public assurance through education, effective regulation and oversight, and surveillance of environmental health conditions, and
3. Public health policies that effectively achieve the DHSS mission.

There is particular cooperation and partnership regarding nonpoint source issues relating to private drinking water, on-site sewage, and other various wastewater systems.

The DHSS Health Laboratory provides limited private well testing services for public assurance of environment health. Local county public health agencies and DHSS provide technical advice to private well owners related to drinking water quality.

The DHSS Bureau of Environmental Health Services works to educate and license contractors that construct or repair on-site wastewater treatment systems. A listing by county of On-Site Wastewater Treatment System Installers may be found at http://health.mo.gov//living/environment/onsite/counties/index.php. In general, DHSS also works with local county public health agencies on the issuance of onsite wastewater treatment system permits. (http://health.mo.gov/living/environment/onsite/permitprocess.php)

To assure the public of fish consumption safety, the DHSS Bureau of Environmental Epidemiology also assesses fish tissue data obtained from Missouri Department of Conservation (MDC) and Department of Natural Resources (DNR) and completes an annual fish consumption advisory. (http://health.mo.gov/living/environment/fishadvisory/index.php)

Related to fish consumption safety, DHSS also provides technical support for DNR's Section 303(d) Impaired Waters Listing and TMDL listings. As needed, DHSS also cooperates with MDC and DNR on fish kills and pollution investigations to protect public health from these events.

C. Missouri Department of Conservation
http://mdc.mo.gov/

Strategic goals of the Conservation Commission and the Missouri Department of Conservation (MDC) are to preserve and restore the state's biodiversity; to inform and educate the public about fish, forest and wildlife conservation; to help landowners manage their land for sustainable resources; to develop and maintain public land that invites public use; and to integrate conservation principles and urban lifestyles. Creating effective partnerships, retaining public support, recruiting new participants and improving their business management systems are also important goals.

During FY2012, Fisheries Division staff responded to 4,974 requests for watershed, floodplain, riparian corridor, and stream or lake management information and technical assistance on streams or lakes. MDC made 660 on-site visits and wrote 100 recommendation letters or management plans. On-site work included 238 stream problem investigations, 119 fish population surveys and 40 fish-kill investigations. Staff conducted 10 stream or lake management workshops attended by 248 people. MDC also coordinated or participated in 28 active watershed-focused resource management projects.

D. Missouri Department of Agriculture

http://mda.mo.gov

The Missouri Department of Agriculture sets agriculture policy and provides assistance to farmers throughout the state. While the Department maintains its regulatory functions, its expanded duties include: consumer protection; public health roles; environmental advocacy; agricultural marketing; public information and awareness; and promoting new technology and new uses for Missouri's agricultural goods. As its primary mission, the Department strives to serve, promote, and protect the agricultural producers, processors, and consumers of Missouri's food, fuel, and fiber products.

Pesticide Applicator Training

Section 281.100 and 2 CSR 70-25.050 (2) of the Missouri Pesticide Use Act and Code of State Regulations authorizes the Missouri Department of Agriculture's Bureau of Pesticide Control to establish minimum criteria for re-certifying Missouri certified Commercial and Non-commercial Pesticide Applicators and Public Operators. Each re-certification training course must be approved in advance by the Bureau of Pesticide Control. http://mda.mo.gov/pi/pesticide_control.htm

Dead Animal Reporting

The Animal Health Division responds to reports of dead livestock that have not been properly disposed. Division staff do not dispose of the animals, but do attempt to locate those responsible and see that they properly dispose of the carcasses in a timely manner as required by the Disposal of Dead Animal Law, Chapter 269, RSMo. http://www.mda.mo.gov/ah/dead_animal.htm. The division only investigates animals raised for commercial purposes and does not respond to reports of dead animals under the Wildlife Code (deer, coyotes, etc.), or pets, whether confined or stray.

E. United States Geological Survey

http://mo.water.usgs.gov/district_info/index.htm (MO Water Science Center)

The United States Geological Survey (USGS) is the nation's largest earth-science agency and has the principal responsibility within the federal government for providing hydrologic information and for appraising the nation's water resources. The water resources of Missouri consist of numerous streams, springs, lakes, and aquifer systems. During water year 2011, the USGS Missouri Water Science Center measured continuous stream flow at 317 stream-gauging stations, continuous water-surface elevation at 16

lakes and reservoirs, continuous water-level elevation at 167 ground-water wells, and water-quality at 26 surface water-quality stations. These hydrologic data and other data are used in research and hydrologic studies to describe the quantity, quality, and location of Missouri's water resources. The collection, analysis, and interpretation of these data are done in cooperation with other Federal, State and local agencies, universities, and research centers. Water quality data is made available on the Internet at: http://waterdata.usgs.gov/mo/nwis/rt.

V. Teams, Committees, and Volunteers

A. Missouri Water Quality Coordinating Committee

The Water Quality Coordinating Committee (WQCC) is an informal interagency and public committee dealing with water quality issues. Representatives from non-profit organizations, universities and colleges, cities and businesses, as well as state, federal and local agencies, regularly attend WQCC meetings. It is informal in that the committee has no statutory or regulatory foundation. It exists through and for the participants. Each agency or group brings issues, information or requests to the committee that are related to water quality, and each continues to exercise its statutory responsibilities.

The Department of Natural Resources originally convened the WQCC to deal with animal waste issues, specifically, poultry in southwest Missouri. The committee's activities continue to be organized through the Department's Water Protection Program. As a forum for discussion among agencies on that issue, it was readily apparent that the information exchange and coordination opportunities afforded by the committee were valuable far beyond that original issue, and the committee's scope expanded. A sampling of issues brought before the committee for this reporting period include: Summary of Missouri Stream Teams Report on Invertebrate Data, On-site Wastewater in Missouri, New Pesticide General Permit, A Nine Element Watershed Plan in the Lower Meramec Basin: Planning Challenges in Urban Areas, Nine Critical Elements to Watershed Planning: an Overview from EPA Region 7, CAFO Regulations Update, Big River Watershed: Overview and Superfund Actions, Missouri Nutrient Reduction Strategy, 319 Nonpoint Source Program Direction and Request for Proposals.

The committee meetings are open to the public, which gives the public an opportunity to address the agencies on specific water quality concerns. Speakers included members from Missouri Department of Natural Resources, Missouri Stream Team Watershed Coalition, University of Missouri - Columbia, East-West Gateway Council of Governments, EPA Region 7, ant others. The Committee may also assist in the coordination and implementation of watershed protection strategies.

During this annual reporting period, four meetings were held. Future meeting information and minutes from previous meetings can be found on the Department's Web site at http://www.dnr.mo.gov/env/wpp/wqcc/index.html.

B. Water Protection Forum

The Water Protection Forum was initiated in May 2005 as a means to involve a diverse set of individuals in water quality policy discussions. A wide diversity of interests is represented in the forum, including agriculture, municipalities, industry, environmental groups, consultants, attorneys, and others. The Department must always consider how policy issues affect regulated entities and the public and this is a means to solicit input from those affected interests.

Due to the many complex issues presented at the main Water Protection Forum meetings, the group formed several advisory groups to work on selected issues. These subcommittees include:

- 303(d) List/Water Quality Monitoring Issues,
- Antidegradation Implementation Procedures,
- Continuing Authorities,
- Federal Safe Drinking Water Rules/Design Guide,
- Funding/Staff/Resources,
- Small Flows (<22,500 gal/day) Effluent Limits/Lagoon Pesticides Policy,
- State Revolving Fund Priority Points/Process,
- Unclassified Streams/Wetland Classification/Tiered Aquatic Life,
- Water Quality Effluent Limits/Effluent Dominated Streams/Waivers to Disinfect,
- Nutrient Criteria Development Stakeholder Workgroup, and
- Missouri Nonpoint Source Management Plan Revisions Stakeholder Meetings.

During this annual reporting period, ten meetings of the entire forum were held along with multiple subcommittee meetings. Note that due to potential 319 NPS Program reforms, the Nonpoint Source Management Plan Revisions subcommittee did not convene during this reporting period. Future meeting information and presentations from previous meetings can be found on the Department's Web site at http://www.dnr.mo.gov/env/wpp/cwforum/index.html.

C. Water Resources Center

Information on DNR's Water Resources Center can be found at: http://www.dnr.mo.gov/env/wrc/index.html.

The Mission of the Missouri Water Resources Center is to administer the development, conservation and use of the state's water resources. The Center's primary role is to provide technical advice and assistance on water use, comprehensive water supply and use planning, ground water, and surface water hydrology.

Collection, maintenance and interpretation of water resources information is imperative in order for Missouri to respond to environmental and economic problems related to

water. Types of issues requiring this kind of information include: interstate water availability and usage, public water well locations, water quality and quantity determinations, drought and flood response and planning, coordination and resolution of river basin issues, major water users data collection, groundwater and surface water contamination potential and prevention, and water use decisions.

One can find links to a magnitude of information, both for general knowledge and potentially helpful for watershed planning. These links include drought information, dam and reservoir safety, interstate waters, State Water Plan, groundwater, springs and caves, major water users, surface water, wetlands, publications, forms, frequently asked questions, a staff directory and links to other water related sites.

D. Missouri Stream Teams/Volunteer Water Quality Monitoring Program

A summary of Stream Team-related activities, including Volunteer Water Quality Monitoring (VWQM) can be found in this section. More detailed information about Missouri Stream Team and Volunteer Water Quality Monitoring programs can be found at the following Number of Stream Teams formed in fiscal year 2012 was 191. These are comprised of 166 teams formed by adults and 25 youth formed teams.

- Number of volunteers attending the Missouri Stream Team Program's VWQM workshops in calendar year 2012 was 325 attendees at 23 workshops. Note: Individuals can and do attend more than one workshop in a year. Therefore, the number of citizens trained without counting them twice or three times would be slightly less than the count provided. The individual workshops/audits have the following values:
  - 9 "Introduction to VWQM" workshops attended by 212 citizens.
  - 4 Level 1 workshops attended by 57 individuals.
  - 5 Level 2 workshops attended by 33 participants.
  - 1 Level 3 audit held for 1 participant.
  - 5 VWQM Validation workshops attended by 23 Level 2 and higher participants.
  - 1 Macroinvertebrate Workshop attended by 21 individuals

  Amount of data submitted to the Stream Team Program: See individual watershed (8-digit HUC) descriptions. Number of newsletters developed by Stream Team staff:
- Missouri Department of Conservation's Channels newsletters can be found at http://www.mostreamteam.org/channel.asp

  Stream Team Activities:

Table 15. Stream Team Training Levels by HUC

(Levels listed lower to higher)

HUC8	WQ001	WQ101	WQ102	WQ201	WQ202	WQ301	WQ401
07110001			4		9	1	
07110003					1	1	
07110004	1						
07110005					2		
07110006	1						
07110008			8			2	
07110009		1	2				31
07140101	7		109		46	14	
07140102	7		102	2	77	18	
07140103			3		3		
07140104	1				4		
07140105	1						
07140107	2						
08020202			1		2		
10010006			9				
10010008	1						
1020109			1				
10240005					28		
10240011	1		3				
10240012	1		12				
10240013	3			1		4	
1024005					1		
10280202					1		
10290102					2		
10290105					1		
10290106			2	2	8		
10290107			2			2	
10290108	1		2				
10290109	2		4		1		
10290110	1			1	7	10	
10290111	3	1	1		4		
10290201	6		4		4		
10290202	2				15		
10290203	2		6	3	3		
10300101	6			1	5		
10300102	16		9	1	20	4	
10300103	1		3		4		
10300104	2		1				
10300200	11		7		20	2	13

10390107			1				
11010001	2		2		1		
11010002	8		19	1	34		
11010003	10	1	1		4		
11010006			45		6	7	
11010007	2				1		
11010008	11		9		4		
11070206					5		
11070207	5		3		36	1	
11070208	2						
TOTALS	119	3	375	12	359	66	44

Table 16. Table of Stream Team Activities during FFY 2012

Activity	Reported for FFY2008	Units	Participants (#)	Time Spent (hrs)
Adopt An Access	8	agreements	10	24
Advocacy (for streams and WQ)	10	events	14	45.5
Participated in other agency project	2	events	21	165
Article completed for media	57	articles	6	218
Stream Team Associations	101	meetings	235	1378.7
Awards	4	awards	16	28
Display at public event	8	events	105	533.5
Educational project	1197	events	962	3065.04
Forestkeepers	2	trips	3	6
GRT	3	projects	13	59
Habitat improvement (not bank stabilization)	52	projects	303	1176
Inventory	152	events	27	29.5
Wrote letter in support of issue	54	letters	32	38.50
Litter pickup	456	events	7969	33742.56
Media interview	16	interviews	26	86.8
Mentoring another Stream Team	6	events	8	24
Held/Attended Stream Team meeting	52	events	428	802.4
Other Projects	22	projects	268	1594
Tree planting	29	events	264	1325.42
Photo Point Monitoring	7	trips	14	15
Presentation to groups, government, etc.	21	events	79	129
Planning	350	projects	344	858.25
New members recruited	184	people	143	233.5
River Watch/Watch Dog	1	events	12	84
Storm drain stenciling	681	drains	258	1056
Stream bank stabilization project	3	projects	9	29
Watershed mapping	6	events	18	28
Attended workshop	383	attendees	383	3242.5
Water quality monitoring	1614	datasheets	2565	6349.32
TOTAL	**3881**	**events**	**14535**	**63551**

Table 17: Number of Volunteer Water Quality Sampling Events Conducted Statewide

Training Level	Monitoring Category			
	Invertebrate	Chemical	Visual	Flow
Intro/1	165	320	225	157
2	132	306	120	120
3	31	50	27	25
4	12	43	15	6
TOTAL	340	719	387	308

Additional information can be found in the Missouri Stream Team Annual Reports: http://www.mostreamteam.org/annreport.asp.

VI. Conclusion: Future Efforts

In FFY2012, an update of the "Key Components of an Effective State Nonpoint Source Management Program" was provided by EPA. In addition, new draft 319 Nonpoint Source Program guidance has been provided for comment that will replace the 2003 program Guidance in FFY2013. Missouri will incorporate these new program guides into a new Nonpoint Source Management Plan scheduled for completion in calendar year 2013.

Missouri anticipated the need for 319 NPS program reforms and began discussion in 2011 to revise the state's watershed based approach to better influence water quality. Key drivers of upcoming state program revisions include: the Department's "Our Missouri Waters Initiative"; EPA Kaizen process evaluation, internal Department administrative grant process mapping, and a revised Nonpoint Source Program Document. A workshop was held with EPA's R5 Nonpoint Source Expert and the Coordinators of Ohio's nationally acclaimed NPS Program. This 319 workshop was highly productive and revealed several significant areas for program and fiscal improvements.

Our Missouri Waters is an effort to move Missouri towards watershed-based management; making decisions while looking at an entire watershed, and not just parts of it. The initiative brings the diverse parts of the Missouri Department of Natural Resources together to maximize resources and approaches. The three pilot watersheds were selected to demonstrate and evaluate the feasibility of water resource management on a targeted basis Lower Grand River, Big River, and Spring River. The pilots will help the department develop the necessary infrastructure, policies and procedures to implement this approach across all 66 of the state's HUC-8 level watersheds.

EPA initiated a Kaizen Effort in Kansas City in August 2012 that consisted of team member representation from the four Region 7 states. The event addressed the EPA Region 7 Water 319 grant process beginning with the state process for soliciting proposals for 319 projects through award of grant funds to EPA approval of state project implementation plans. As a result of this initial Kaizen meeting, action items were assigned to both EPA and the states. The Goals are to:

1. Establish a better understanding of the Water 319 grants process
2. Improve consistency of requirements, processes, reviews, etc. across all states and EPA state coordinators
3. Clearly identify state and EPA roles and responsibilities
4. Standardize response times and time frames for action
5. Be aware of ways to address national program expectations

As a result of this initial meeting and to help reach these goals and objectives, 21 action items were assigned between EPA and the states. Missouri is the lead for two of these action items; 1) Further "Lean" and Review State's Own Internal Processes" and 2) Develop and identify Best Practices.

In June 2012, the Department initiated several mapping processes including one for the 319 processes. The effort will serve to provide direction for all grants processes in programs throughout the Department. The purposes of process mapping are to: 1) Automate, standardize and understand the process and time required to accomplish specific tasks or sets of tasks. By doing this we can provide better service, make a process more efficient and/or prepare to change it; 2) understand the process, to understand roles, and identify decision points within that process; 3) improve the process.

Out of this process, the Process Mapping Team can determine if there is a need for policy development or evaluation, discover where efficiencies can be created, prepare for any enhancements, and/or consolidate processes. The process mapping will be completed in two phases. The first phase will determine "As is" processes, while the second phase will recommend a "To be" process. The team has met one to two times per month starting the latter part of September 2012. Additional meetings are conducted to maintain the schedule. The team anticipates the process to be completed and a final report provided to the Department Director's Office by May of 2013.

A revised Nonpoint Source Management Plan is in process of development and a draft will be presented to EPA in calendar year 2013. Substantial program reform is anticipated consistent with new program guidance, OMW, Kaizen, outcomes of the Ohio/R5 EPA workshop, and process mapping described above. The plan will have narrower focus, specific and achievable measures of progress utilizing watershed targeting and worthy use of grant funds.

The Missouri Department of Natural Resources and their resource partners will continue a watershed approach to address nonpoint pollution according to the guidance of Missouri's Nonpoint Source Management Plan. The Department anticipates continued success in the use of funding sources to improve water quality, while concurrently improving upon reporting and evaluation measures as specified in the Nonpoint Source Management Plan.

Questions regarding this report or other nonpoint source management issues in the State of Missouri should be directed to Greg Anderson, 319 Nonpoint Source Program Coordinator, Missouri Department of Natural Resources, Water Protection Program, P. O. Box 176, Jefferson City, MO 65102, by phone at (573) 751-7144, or by email at greg.anderson@dnr.mo.gov.

VII. APPENDIX A

G07-NPS-03

Perry County Karst Protection Project

HUC# 07140105040

PROJECT DESCRIPTION

This project provided the needed information on the water quality and recharge areas of the major caves and springs in the Perryville Karst area. The information was used to be incorporated into the Watershed Management Plan for the Perry County Karst area, and to educate and promote the best management practices to stakeholders.

OBJECTIVES

1. To protect the unique cave ecosystem by collecting water quality data to determine the sources and types of pollution, then develop a plan to reduce the pollution entering the cave system.
2. To get the landowners in Perry County to understand the magnitude and complexity of the karst features in their county.
3. To help landowners take ownership and protect the unique cave resources by discontinuing the dumping of wastes in sinkholes, and cleaning up old trash piles already located in sinkholes.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan (QAPP) developed
- ✓ Dye Tracing Report completed
- ✓ Recharge area delineation and mapped
- ✓ 4 Sink holes cleaned out and trash removed
- ✓ 3 Sinkholes with established buffer or exclusion
- ✓ 3 Filter strips – riparian or sinkhole
- ✓ 1 Karst video developed
- ✓ 3 Radio or TV interviews
- ✓ 4 Workshops on Karst features
- ✓ 20 Project presentations
- ✓ 15 Newsletters
- ✓ 2 Landowner and agency field days demonstrating BMPs and water quality in Karst systems
- ✓ 8 Public and agency meetings
- ✓ 18 Kid's educational projects
- ✓ Surveys and test results from info/ed activities
- ✓ Electronic copy of raw data submitted to MDNR
- ✓ Quarterly, Annual, and Final Reports

COOPERATING AGENCIES

Missouri Department of Conservation, USDA – Natural Resources Conservation Service

CONTACT

Sponsor: Perry County Soil and Water Conservation District
Project Manager: Brad Pobst
Missouri Department of Conservation
2302 County Park Drive
Cape Girardeau, MO 63701
(573) 280-5730 ext. 238

MDNR Project Manager: Georganne Bowman/Trish Rielly
Project Period: October 1, 2006 – November 30, 2011

FY05-319 Grant:	$194,905
Match:	$142,208
Total Project Cost:	$337,113

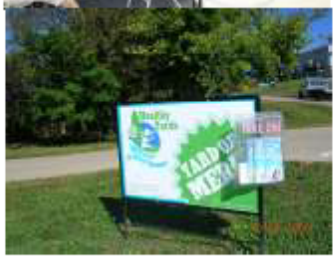
G09-NPS-01

Assisting Communities to Implement a Healthy Yards for Clear Streams Program

Statewide

PROJECT DESCRIPTION

The grant will be used to launch a statewide Healthy Yards for Clear Streams program modeled after a similar program in Jefferson City. Through a workshop series, University of Missouri Extension offices throughout the state will teach the connections between quality landscapes and environmentally friendly practices to increase public awareness. With this grant, educational efforts will demonstrate yard care and maintenance practices that homeowners can easily implement to help reduce the amount of runoff from their properties and to prevent excess lawn care products, such as fertilizers and pesticides, from entering our waterways.



OBJECTIVES

- To provide education to an average of approximately 85 local citizens at an estimated 7 communities over a two-year period. The programming would focus on cost-saving and cost effective alternatives to traditional lawn and landscape practices that could provide an incentive for citizens to modify their behaviors to protect water quality.
- Recognize approximately 245 local citizens who are implementing watershed friendly lawn and landscape maintenance through the "Yard of Merit" program (assumes 35 yards featured at each community over a two-year period).
- Expand the program to statewide to expand the "brand recognition" of this program and lay the basis for a going program.

METHODS EMPLOYED

- ✓ 20 news releases
- ✓ 6 newsletter articles
- ✓ 5 communities distributing brochures
- ✓ 20 Yard of Merit signs
- ✓ 1 Train the Trainer Workshop
- ✓ 9 Healthy Yards for Clean Streams Workshops
- ✓ 1 statewide website
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

MU Extension Master Gardeners, Missouri River Communities Network, Mid-America Regional Council, and Natural Resources Conservation Service

CONTACT

Project Manager: Christopher Starbuck
University of Missouri Extension
310 Jesse Hall
Columbia, MO 65211
(573) 882-9630

MDNR Project Manager: Mandy Sappington
Subgrant #: G09-NPS-01
Project Period: October 1, 2008 – October 31, 2011
FY03 & 05 319 Grant: $10,000 (FY03 $1,828; FY05 $8,172)
Match: $6,776
Total Project Cost: $16,776

G09-NPS-10

Redesigning the Jacks Fork River

HUC # 11010008

PROJECT DESCRIPTION

The majority of the project will focus its efforts toward the development of a coalition to establish a watershed-wide trail system that addresses issues of the river crossing, stabilization and design, conduct feasibility assistance to two campgrounds to hook-up to the Eminence Wastewater Treatment Facility, and two entities to consider establishing a recreational vehicle or horse trailer dump station. As part of the project's information and educational effort, the project sponsored an annual water quality field day for 4th and 5th grade students.

OBJECTIVES

The overall objective is to reduce fecal coliform bacteria in the Jacks Fork River by focusing on the following areas:

Campgrounds:

1. Upgrade two primitive latrines to commercial vault toilets by offering a 50% cost-share. Educational signage will be installed and educate on possible alternative solution.
2. Provide feasibility assistance to two campgrounds to hook up to the city of Eminence wastewater treatment system. The feasibility will include cost analysis, minimal siting assistance, contracts, and other pertinent data.
3. Provide feasibility assistance to two entities about installing a trailer (recreational vehicle and/or horse) dumping station in the Eminence vicinity. The feasibility will include cost analysis, minimal siting assistance, contracts, and other pertinent data.

Youth Information and Education:

1. Sponsor an annual water quality field day for 4th and 5th graders at local school districts within the Jacks Fork River Watershed.
2. Expand to three school districts within the Upper Current River Watershed.
3. Provide content to a fledgling Web site.

River Clean-ups:

1. Assist with river clean-ups in order to demonstrate how much trash and debris is thrown into the river and/or watershed.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan (QAPP) developed
- ✓ Analysis of trends, and data overview supplied annually to DNR
- ✓ Electronic copy of raw data submitted to DNR
- ✓ Quarterly, Annual and Final Reports
- ✓ Webpage development
- ✓ Feasibility Studies
- ✓ NEPA meetings for trail guide
- ✓ River Clean-ups
- ✓ Annual field days for local schools
- ✓ Cost-share incentives

COOPERATING AGENCIES

Jacks Fork River Watershed Steering Committee
National Parks Service – Ozark National Scenic Riverways
Local Stream Team

CONTACT

Project Manager: Lisa Ruller
Top of the Ozarks RC&D
6726 Highway 63
Houston, MO 65483
(417) 967-2028 ext. 5

MDNR Project Manager: Trish Rielly
Project Period: May 1, 2009 – April 30, 2012

FY07-319 Grant:	$202,608
Match:	$135,072
Total Project Cost:	$337,680

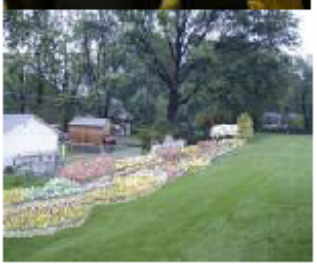
G09-NPS-13 and G11-NPS-15

Missouri Botanical Garden Deer Creek Watershed Initiative Phase I & II

HUC #07140101

PROJECT DESCRIPTION

The watershed initiative is a continuing project currently being conducted by the Missouri Botanical Gardens and other partners. The goal of the initiative is to reduce organic waste pollution in the Deer Creek Watershed, primarily through the implementation of bioretention and other green infrastructure methods. Initiative strategies include work with schools, demonstration projects, data collection, and community outreach.



OBJECTIVES

The main goal of the Missouri Botanical Garden Deer Creek Watershed Initiative project (Phase II) is to reduce impacts in the Deer Creek Watershed by implementing green infrastructure technologies to improve water quality stemming from nonpoint source pollution, with a focus on plant-based solutions.

The project will use various techniques to achieve the overall goal through implementation, demonstration, education, and planning efforts. These techniques will be utilized to achieve the overall objectives:

- Decrease erosion, sedimentation and other nonpoint source pollutants by capturing and infiltrating storm water runoff on-site by utilizing volume-based hydrology approaches.
- Protection of streams and groundwater from chloride.
- Reduce bacteria pollution in the watershed related to animal waste.
- Reduce water pollution caused by yard waste and organic debris.

METHODS EMPLOYED

- ✓ Develop Quality Assurance Project Plan
- ✓ Develop and implement municipal and homeowner cost-share programs
- ✓ Conduct Education/Outreach Programs and host public meetings
- ✓ Development of a nine element watershed management plan
- ✓ Demonstrate Best Management Practices
- ✓ Develop web site, news releases, newsletters, fact sheets and surveys
- ✓ Quarterly, Annual and Final Reports

COOPERATING AGENCIES

- ✓ St. Louis Metropolitan Sewer District
- ✓ Washington University
- ✓ East-West Gateway Council of Governments
- ✓ Soil and Water Conservation District
- ✓ American Society of Civil Engineers
- ✓ Great Rivers Greenway District
- ✓ Missouri Department of Conservation

CONTACT

Project Manager: Deborah Frank, Vice President
Missouri Botanical Gardens
P.O. Box 299
St. Louis, MO 63166
(314) 577-0279
Email: Debora.frank@mobot.org

MDNR Project Manager: Trish Rielly
Subgrant #s: G09-NPS-13/G11-NPS-15
Project Periods: June 1, 2009 – December 31, 2011/
April 1, 2011 – March 31, 2014

FY05/FY08-09 319 grant:	$272,011/$706,724
Match:	$260,363/$471,957
Total federal funding:	$650,829/$1,178,681

G11-NPS-01

Lake Ozark Watershed Alliance/Low Impact Landscapes Project

HUCs # 102901090406 & 102901090407

PROJECT DESCRIPTION

Through education, information, and outreach this project increased public knowledge of their own impact on surface water and groundwater quality through their contributions to nonpoint source pollution. The ultimate goal of the project was to stimulate individuals within the watershed to modify those habits and behaviors which may contribute to nonpoint source pollution of the Lake of the Ozarks. Landscapes or yards will be solicited and selected to demonstrate the benefits of Low Impact Landscapes (LILs).

OBJECTIVES

The long-term goal of the project efforts will be to implement the LILs and showcase their environmental benefits to the lake. This was completed through the following objectives:

1. Increase knowledge of individuals within the watershed through education/outreach efforts.
2. Design and demonstrate LILs for businesses and residences in highly visible locations to maximize their demonstration potential.

METHODS EMPLOYED

- Conducted general watershed friendly workshops
- Selected for future implementation of LILs
- Conducted 50 sites soil testing
- Produced Public Service Announcement (PSA), press releases will be developed, (3) radio interviews, and local cable television spots completed
- Conduct pre- and post- workshop surveys
- Develop and distribute brochures or informational materials

PRODUCTS

- 4 Pre- and 4 post-surveys
- 4 Workshops
- 50 soil tests
- 3 LILs designed and ready for implementation by spring 2011
- 1 PSA, 3 Press Releases, 4 radio interviews, 1 cable television spot
- Quarterly, Annual, and Final Reports

COOPERATING AGENCIES

University of Missouri-Extension, Healthy Yards for Clear Streams, Barbara Lucks/Show Me Yards and Neighborhoods, Warren Witt/Ameren, Master Gardeners

CONTACT

Project Manager, Caroline Toole
Lake Ozarks Watershed Alliance
P. O. Box 836
Sunrise Beach, MO 65079
(573) 434-4400
Email address: (ckingtoole@yahoo.com)

MDNR Project Manager: Trish Rielly
Project Period: October 15, 2010 – October 15, 2011

FY04 319 Grant:	$10,000
Match:	$6,700
Total federal funding:	$10,000

G11-NPS-03

LOWA LILs for a Healthy Lake of the Ozarks

HUCs # 102901090406 & 102901090407

PROJECT DESCRIPTION

The project is to improve water quality by using watershed friendly landscape techniques. The LOWA Low Impact Landscapes (LILs) management practices that will be used focus on a set of watershed friendly runoff management practices, such as rain gardens, rain barrels, swales, and native plantings, etc.

OBJECTIVES

The overall goal of this project is to implement a subset set of strategies discussed in the Lake of the Ozarks Watershed Alliance (LOWA) watershed management plan for Buck Creek and Lick Branch subwatersheds to reduce nonpoint source loads for nutrients, sediment, bacteria loading utilizing the LOWA LILs approach.

The overall project objectives are:

1. Reduce impairments by decreasing runoff volume through the develop a cost-share incentive
2. Develop educational and outreach programs
3. Promote the LOWA LILs for a Healthy Lake of the Ozarks approach
4. Promoting nutrient reductions: a) making low or phosphorus free fertilizers available to consumers around lake area, and b) encouraging on-site wastewater treatment systems to be up to code
5. Water quality monitoring efforts to document differences in cove types and to compare pre- and post- project efforts

METHODS EMPLOYED

- ✓ Implement aspects of Buck Creek and Lick Branch Watershed Management Plan
- ✓ Series of public workshops and seminars relating to watershed improvements for a healthy lake focus
- ✓ Stakeholder and local government meetings
- ✓ Ordinance development
- ✓ Quality Assurance Project Plan (department accepted)
- ✓ Public Service Announcements, news releases, articles, television and radio interviews promoting project efforts
- ✓ Implementation of storm water management practices
- ✓ Demonstration signs
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

Local retailers (e.g., nurseries, landscapers, contractors, engineering firms), University of Missouri Extension, Ameren Missouri, Camden County Planning and Zoning Commission, Missouri Stream Team Program, Lakes of Missouri Volunteer Program, JLW Web Design, Tan-Tar-A Resort, Scott Concrete, Ozark Rip Rap, Climax Springs One Earth Environmental Club, Gifted Gardens, Sheltered Industry, Ozark Environmental, Schultz & Summers Engineering, Realty Executives – Lake of the Ozarks, Missouri Department of Conservation, Master Gardner's, and citizen volunteers.

CONTACT

Project Manager: Caroline Toole
Lake of the Ozarks Watershed Alliance
P. O. Box 836
Sunrise Beach, MO 65079-0836
(573) 434-4400 or 374-1331
Email address: ckingtoole@yahoo.com

MDNR Project Manager: Trish Rielly
Project Period: January 1, 2011 – December 31, 2014
FY08-09 319 (I) Grant: $740,000
Match: $495,770
Total funding: $1,235,770

G11-NPS-06

Springfield/Greene County Urban Watershed Stewardship Project

HUC # 10290106 and 11010002

PROJECT DESCRIPTION

The approach of this project will be to monitor the performance of the selected BMPs at individual site and regional levels in all of the sub-watersheds, as well as estimate pollutant loading improvements at sub-watershed outlets, so that BMP designs and improvements can be incorporated into criteria manuals and future policies and ordinances addressing urban water quality. Lessons learned from this project will be applied to all of the urban and urbanizing watersheds in the Springfield metropolitan area, which is projected to extend to over ninety square miles by 2020.

OBJECTIVES

The primary goal of this project is to improve the quality of runoff and reduce the quantity of runoff leaving the Springfield/Greene County urban area through the implementation of measures to reduce nutrients, bacteria, sediment and runoff volumes in support of the TMDLs and watershed management plans established for the James River and the Little Sac River, the two receiving waters draining the greater Springfield urban area.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan
- ✓ Low Impact Development (LID) techniques and practices
- ✓ Quarterly, Annual, and Final Reports
- ✓ Rain Gardens, pocket wetlands, rain water harvesting, impervious surface disconnection
- ✓ Website, newsletter/newspaper articles, Public Service Announcements
- ✓ Bio-retention, forebays, riparian stabilization/restoration
- ✓ Water quality monitoring at selected sites
- ✓ Analysis of trends, and data overview supplied annually to DNR
- ✓ Presentations

COOPERATING AGENCIES

The City of Springfield/Stormwater Services Division
Greene County/Resource Management Division
Missouri State University
Ozark Greenways
The James River Basin Partnership
Missouri Project WET

CONTACTS

Ms. Stacey Armstrong, Project Manager
Watershed Committee of the Ozarks
320 N. Main Avenue
Springfield, MO 65806
(417) 866-1127, ext. 125
E-mail: Stacey@watershedcommittee.org

MDNR Project Manager: Trish Rielly
Project Period: May 1, 2011 – April 30, 2015

FY08-09 319 (Incremental) Grant:	$1,000,000
Match:	$684,900
Total project cost:	$1,684,900

G11-NPS-07

Dry Branch Watershed: Clear Stormwater & Green Parks

HUC # 07110008

PROJECT DESCRIPTION

This project is evoking change by increasing community awareness of water quality issues by hosting a groundbreaking ceremony, a stream naming contest, public tours of water quality features, developing a web-based tour, and designing and implementing service learning projects. The focus of the project is to demonstrate water quality park enhancements on the 28-acre tract the City, as well as retrofits to stormwater infrastructure on five other properties. The Heartland Park will feature a wetland forebay, bio-filter zones, permeable pavement, native riparian lake buffers, and a wetland and boardwalk with educational signage.

OBJECTIVES

1. To assess and improve water quality in the Dry Branch Watershed, and to make stormwater cleaner and clearer;
2. To beautify parks, subdivisions, municipal and other private property while saving money on maintenance;
3. To show the community better alternatives to fescue, concrete and pipes;
4. To develop a nine-element watershed management plan that identifies nonpoint source pollutants, sources, and prioritizes solutions in year one and two of the project; and
5. To evoke change by increasing community awareness of water quality issues through service learning projects, web-based education, public tours, groundbreaking ceremonies, and water quality-based contests.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan
- ✓ Electronic copy of raw data submitted to MDNR
- ✓ Quarterly, Annual and Final Reports
- ✓ Watershed Management Plan
- ✓ Water quality monitoring
- ✓ Law Enforcement Center retrofit
- ✓ 2 Commercial stormwater facility retrofits
- ✓ 1 Residential stormwater facility retrofit
- ✓ 1 Wetland forebay
- ✓ Park construction including rain gardens, bioswales, education areas, signage, interpretive trail, pervious pavement, riparian landscape edge, biofilter at athletic fields
- ✓ Data overview supplied annually to DNR
- ✓ Presentations (4)

COOPERATING AGENCIES

- Wentzville Stormwater Advisory Committee
- St. Charles County Soil and Water Conservation District
- Greenway Network, Inc.
- Friends of Wentzville Parks

CONTACT

Project Manager: Jamie Page,
Stormwater Management Coordinator
City of Wentzville
200 East Fourth Street
Wentzville, MO 63385
(636) 639.2030
E-mail: jamie.page@wentzvillemo.org

MDNR Project Manager: Trish Rielly
Project Period: April 15, 2011 – April 14, 2015
FY 08-09 319 (Base) Grant: $748,015
Match: $500,000
Total project cost: $1,248,015

G11-NPS-09

Lake of the Ozarks Niangua Arm Watershed Management Plan

HUC #10290110

PROJECT DESCRIPTION

Lake of the Ozarks Watershed Alliance (LOWA) will develop a watershed management plan (WMP) for the Ha Ha Tonka Watershed, HUC #102901100403 to address the nine (9) critical elements of a watershed plan as identified by the U.S. Environmental Protection Agency (EPA).

Figure 1-2. Location of Ha Ha Tonka Watershed (highlighted red)

OBJECTIVES

LOWA will achieve the goal of completing a nine element WMP for the Ha Ha Tonka watershed through the following objectives:

- ★ Form watershed planning committee;
- ★ Conduct watershed meetings to increase public knowledge, encourage participation, and gather citizen concerns for incorporation into plan;
- ★ Conduct watershed assessment and research available data;
- ★ Estimate current pollutant loads and reductions utilizing a simplified watershed model (e.g. STEPL); and
- ★ Promote project efforts through various media outputs and other activities.

METHODS EMPLOYED

- ✓ PowerPoint Presentations
- ✓ Pre- and Post-Surveys
- ✓ On-line Survey
- ✓ News Releases
- ✓ Other News Articles
- ✓ Webpage Development (Ha Ha Tonka watershed)
- ✓ Accepted Watershed Management Plan
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

Camden Co. Lake District Planning and Zoning Commissioner, Missouri Department of Conservation, Lake Ozark Environmental; University of Missouri - Extension; Geosyntec Consultants; Schultz and Summers Engineering, Soil and Water Conservation Districts, MO and U.S. Dept of Agriculture's Natural Resources Conservation Service, and local businesses.

CONTACT

Project Manager: Caroline Toole, Secretary
Lake of the Ozarks Watershed Alliance
P. O. Box 836
Sunrise Beach, MO 65079-0836
(573) 434-4400 or 374-1331
Email address: ckingtoole@yahoo.com

MDNR Project Manager: Trish Rielly
Project Period: February 15, 2011 – February 15, 2013

FY08-09 319 (I) Grant:	$30,000
Match:	$20,000
Total project funding:	$50,000

G11-NPS-24

Ozark Springs Project

MSU – Bull Shoals Field Station

Springs are unique ecosystems. Their stable year-round temperatures and distinctive water chemistry provide a unique environment for plants and animals not commonly found in the river. At least 38 animal species are found only in Ozark springs and subterranean waters. Watercress and other aquatic plants play a key role in the spring ecosystem by providing organic matter used by other plants and animals and habitat for aquatic insects. Extensive Karst geology means that springs of all types abound in Missouri's Ozarks. The MSU Bull Shoals Field Station Ozark Springs Project will assess the condition of springs in the Springfield Plateau and Salem Plateau geographical regions.

PROJECT DESCRIPTION

The goal of the Ozark Spring Project is to increase awareness of the ecological condition of springs in the Missouri Ozarks among the public and local watershed organizations. The project also aims to raise public consciousness of the effects of nonpoint source pollution on spring ecosystems and educate the public about actions to reduce individual impact on local springs. The project will develop a sustainable online resource to increase awareness of the ecological condition of springs in the Missouri Ozarks and the effects of nonpoint source pollution on spring ecosystems.

OBJECTIVES

The project will develop a spring assessment tool to assist citizens and watershed organizations in assessing the health of local springs. The project will assess the condition of eight sample springs by collecting physical, chemical and biological data.

1. Create a spring assessment tool to assist local citizens and watershed organizations to assess the condition of springs within their watersheds
2. Increase awareness of the effect of nonpoint source pollution on spring ecosystems
3. Create a sustainable online resource for current information on springs, groundwater and nonpoint source pollution in Ozarks communities
4. Collect continuous temperature data, water quality (total nitrogen, total phosphorus, and chloride) data, simple hydrologic (crest gage) data, and conduct algal and vegetation surveys at eight springs to assess ecological condition and complete scorecards for those springs
5. Post hydrology, biology, recharge and water quality data as well as maps and current photos
6. Compile and post Spring Scorecards to provide specific and understandable information about the ecological health of the springs

METHODS EMPLOYED

- ✓ Steering Committee
- ✓ Physical, chemical, and biological assessment on eight springs
- ✓ Spring Scorecard
- ✓ Ozarks Spring website
- ✓ Increased public awareness of springs and nonpoint source pollution
- ✓ Online evaluation forms
- ✓ Quality Assurance Project Plan (department accepted)
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

Upper White River Basin Foundation, James River Basin Partnership, Watershed Committee of the Ozarks

CONTACT

Project Manager: Dr. Beth Davis-Bowles
Authorized Representative: Dr. James Baker
MSU – Bull Shoals Field Station
901 S. National
Springfield, MO 65897
(417) 836-3731
Email address: bethbowles@missouri.state.edu

MDNR Project Manager: Trish Rielly
Minigrant #: G11-NPS-24
Project Period: January 1, 2012 – December 31, 2013
FY08-09 319 Grant: $6,913
Non-federal Match: $4,778
Total funding: $11,691

G12-NPS-02

Asher Creek 319 Project

HUC # 10290106

PROJECT DESCRIPTION

The purpose of the Asher Creek 319 Project is to implement the Little Sac River Watershed Management Plan (WMP). The conservation practices planned for the project (prescribed grazing systems, soil testing and pH correction to increase nutrient uptake, and riparian corridor exclusion) will reduce the nutrients and fecal coliform bacteria entering Asher Creek and the Little Sac River watershed. The project, through the Greene County Soil Water Conservation District (SWCD), is overseeing construction of prescribed grazing systems, riparian corridor exclusion, pH correction incentive programs, and water quality monitoring.

PROJECT GOALS

The main goals of this project are:

1. To begin addressing the critical resources issues identified by the stakeholder committee in the WMP. By selecting a small highly focused area to begin best management practice (BMP) implementation, it is hoped that the work can be completed and documented in the short time given for the project.
2. To further define the levels of impairment in the watershed through weekly monitoring of E. coli, Total Phosphorus (TP), Total Nitrogen (TN) and Optical Brighteners.
3. To educate area producers on the benefits of the project's BMPs and to help them understand the effects those BMPs can have on the watershed on a larger scale.

COOPERATING AGENCIES

- USDA Natural Resources Conservation Service
- Polk County SWCD
- Watershed Committee of the Ozarks (WCO)
- Ozarks Environmental Water Resources Institute (OEWRI)

METHODS EMPLOYED

- ✓ Memorandum of Understanding (MOU) with MSU-OEWRI for water quality sample analysis/ load duration method development
- ✓ MOU with WCO for water quality sample collection
- ✓ Develop contracts with landowners for project BMPs
- ✓ 3 prescribed grazing systems
- ✓ 5 acres of riparian corridor exclusion
- ✓ Quality Assurance Project Plan
- ✓ Soil testing and pH correction – 500 acres
- ✓ 2 field day events
- ✓ Water quality monitoring - 2 years, 6 sites, 1165 total samples
- ✓ Newsletter articles related to this 319 project
- ✓ Quarterly/Annual/MBE-WBE reports to DNR
- ✓ Final Report

CONTACTS

Project Manager: Mr. Will Rhodes
Greene County Soil and Water Conservation District
688 S. State Hwy B, Ste. 200
Springfield, MO 65802
(417) 831-5246, ext. 3
E-mail: will.rhodes@swcd.mo.gov

MDNR Project Manager: Trish Rielly
Project Period: February 1, 2012 – January 31, 2014

FY10 319 (Incremental) Grant:	$134,186
Match:	-0-
Total project cost:	$134,186

G12 -NPS-03

The Middle and Upper James River Show-Me Yards, Neighborhoods, Farms and Ranches

HUC # 11010002

PROJECT DESCRIPTION

This project expands the Show-Me Yards and Neighborhoods (SMY&N) program to include rural, agricultural, and suburban areas within the James River Basin with an initial focus on the Pearson Creek Watershed (PCW) to include small farms and ranches of 300 acres or less. The expanded Show-Me Yards, Neighborhoods, Farms & Ranches (SMYNFR) program will be co-sponsored by James River Basin Partnership (JRBP) and the city of Springfield.

OBJECTIVES

The overall goals of this project are to (1) increase citizen and local government knowledge and participation; and (2) reduce the amount of nutrient loading in the PCW. The overall goal of the project will be achieved through the following objectives.

1. Expand the successful SMY&N Program into the PCW to include small farms and ranches by using existing and/or developing new workshop and training formats.
2. Provide a variety of cost-share incentives throughout the PCW focusing on riparian owners where possible and as owner interest dictates.
3. Review historical water quality data and obtain new water quality data to detect water quality improvements resulting from project efforts.
4. Market and promote project efforts to maximize participation in training and cost-share incentive programs.

METHODS EMPLOYED

- ✓ Protection or establishment of 1200 linear feet of riparian forest buffer
- ✓ Installation of two stream protection best management practices (BMPs) from the tool box of practices
- ✓ 25 soil tests
- ✓ 25 4-year Nutrient Management Plans (NMP)
- ✓ 1 cistern demonstration project or any combination of 10 low impact development (LID) practices
- ✓ 200 on-site wastewater treatment system (OWTS) cost share pump-outs (Pending DNR approval of additional funding request)
- ✓ 2 training workshops for home and small farm owners
- ✓ 2 training workshops for developers and lawn care professionals
- ✓ 1 satellite SMYNFR program in a community located in the James River Basin
- ✓ 1 model homeowners association covenant
- ✓ 32 updates in the JRBP and city of Springfield quarterly and monthly newsletters
- ✓ A suite of revised SMYNFR brochures for distribution
- ✓ A SMYNFR page on the JRBP and city of Springfield web sites
- ✓ A webcast to explain the SMYNFR program to potential satellite sponsors
- ✓ An approved Quality Assurance Project Plan (QAPP)
- ✓ A series of 4 news releases over the life of the project
- ✓ 2 Public Service Announcements (PSAs) about the availability of the program
- ✓ 8 quarterly reports to DNR
- ✓ 1 final report to DNR

COOPERATING AGENCIES

- City of Springfield
- Greene County Stormwater Management
- University of Missouri Extension
- Missouri State University (MSU)
- Ozarks Environmental and Water Resources Institute (OEWRI)
- Natural Resources Conservation Service
- Missouri Department of Conservation
- Greene County Soil and Water Conservation District
- Watershed Committee of the Ozarks

CONTACT

Project Manager: Melissa Bettes
James River Basin Partnership
Park Central Office Building
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Springfield, MO 65897
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MDNR Project Manager: Trish Rielly
Project Period: March 1, 2012 – February 28, 2014

FY10 (I) 319 Grant:	$293,506
Match:	$195,729
Total federal funding:	$489,235

G12-NPS-10

The Gifted Rain Garden Implementation and Educational Project

HUC # 10290110

PROJECT DESCRIPTION

The Gifted Gardens Facility plans to demonstrate bioretention methods to mitigate nonpoint source runoff. The location of the facility provides an excellent site for demonstrating stormwater management techniques while addressing nonpoint source pollution at the Lake of the Ozarks.

OBJECTIVES

The overall goal of the project is to:

- Implement and demonstrate a variety of management practices (e.g., swales, rain gardens, native plantings, vegetative check dams) on the Gifted Garden site to mitigate nonpoint source runoff, with an option of implementing a second rain garden demonstration site at a separate business location.
- Educate local citizens regarding the applicability and effectiveness of such treatment systems by promoting and implementing educational workshops for the community.
- Provide staff training and create an opportunity to create a part-time position for a person with disabilities.

METHODS EMPLOYED

- ✓ Conduct 3 educational workshops
- ✓ Design & implement 1 bioswale, 2 rain gardens
- ✓ Train 2 staff on rain garden design, implementation, and plant selection techniques
- ✓ Provide 1 person with disabilities with part-time work
- ✓ Print and distribute 500 rain garden informational brochures
- ✓ Administer pre/post surveys
- ✓ Develop newsletter and newspaper articles
- ✓ Educational signs
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

Ameren Missouri, Natural Resources Conservation Service, Lake Area Master Gardeners, Missouri Department of Conservation

CONTACT

Project Manager: Tiffany Riemann
Lake Area Industries, Inc.
Gifted Gardens
1720 N. Business Route 5
Camdenton, MO 65120
(573) 346-7934
Email address: tiffany@lakeareaindustries.org

MDNR Project Manager: Trish Rielly
Project Period: May 1, 2012 – April 30, 2014

FY08-09 319 (B) Grant:	$10,000
Match:	$6,700
Total funding:	$16,700

G12-NPS-12

Immanuel Rain Gardens for Clean Streams

HUC # 07110009

PROJECT DESCRIPTION

The project plans to demonstrate rain gardens on campus and provide outreach and education to students, teachers, and community members about the benefits of rain gardens. Students will evaluate the biodiversity of the rain garden area before and after installation. This will include taking inventory of the plants and animals/insect life. Students will measure and record rainfall amounts on a daily basis. Gallons of water will be calculated to determine the amount of stormwater that is being treated by the rain garden.

OBJECTIVES

The overall goals of the project are to:

- Implement and demonstrate rain gardens
- Increase public awareness and educate students

The project will be completed through the following objectives:

- Inform and educate students/public about best management practices
- Encourage student participation in community stewardship efforts
- Provide community outreach through newsletters and newspapers
- Demonstrate rain gardens as part of a working stormwater system
- Change perception about beautiful infrastructure
- Provide beautiful, functional amenities on campus

METHODS EMPLOYED

- ✓ Design and implement two rain gardens
- ✓ School curriculum
- ✓ News releases on rain gardens
- ✓ Educational signs
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

- SLM Consulting LLC, Susan Maag
- Show-Me Rain Garden Program, Jenn Lewis
- St. Charles Soil & Water Conservation District

CONTACT

Project Manager: Allison Dolak
Immanuel Lutheran School
632 E. Highway N
Wentzville, MO 63385
(636) 639-9887
Email address: adolak@ilcsw.net

MDNR Project Manager: Trish Rielly
Minigrant #: G12-NPS-12
Project Period: April 15, 2012 – December 31, 2012

FY08-09 319 Grant:	$5,770
Match:	$3,730
Total funding:	$9,500

G13-NPS-03

Partnership for Cleaner Water Through Illegal Dump Cleanup, Education and Community Involvement Project

HUC # 10290109

PROJECT DESCRIPTION

The overall goal of the project is to cleanup Goodwin Sink and Goodwin Pit Cave to reduce water quality impacts to the Ha Ha Tonka Spring. The goal will be achieved through a phased approach.

OBJECTIVES

1. Create partnerships by increasing the number of partners/stakeholders involved in the cleanup, the project insures that a larger base of people will be interested in maintaining and protecting the site and local water resources. This will be a continuous effort.
2. Send out two press releases about the clean-up dates and/or clean out progress and increase the number of partner organizations participating (approx. six).
3. Educate the community: The program hopes to improve environmental stewardship among a larger percentage of the public by providing education on the negative impact of nonpoint source pollution (illegal dumping) and its relationship to polluting groundwater in karst areas. During cleanups, volunteers will be briefed on the water quality impacts of dumping at this site.
4. If funding and time allows, conduct rock work to stabilize the area.
5. If funding and time allows, limit access to the site to deter and eliminate dumping at the sinkhole by constructing an earthen berm and fencing.

METHODS EMPLOYED

- ✓ Create partnerships and recruit volunteers
- ✓ Press releases to advertise project efforts and solicit interest
- ✓ Public education through clean-up event participation and school tours
- ✓ Educational signage at site
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

Missouri Cave and Karst Conservancy, Laclede County Commission, Laclede County Road and Bridge Department, Scrap Tire Unit of the Missouri Department of Natural Resources' Solid Waste Management Program

CONTACT

Project Manager: Tammy Snodgrass
Meramec Regional Planning Commission (MRPC)
4 Industrial Drive
St. James, MO 65559
(573) 265-2993
Email address: tsnodgrass@meramecregion.org

MDNR Project Manager: Trish Rielly
Project Period: September 1, 2012-August 31, 2013

FY08-09 319 Grant:	$10,000
Match:	$7,426
Total funding:	$17,426

G12-NPS-04

Spring River Watershed Management Plan Implementation Project

HUC #11010010

PROJECT DESCRIPTION

The Spring River Watershed Management Plan Implementation project is being implemented in southwest Missouri, in and around the city of Carthage in Jasper County. This area of Spring River is approximately 38.73 square miles and has been noted as impaired due to high levels of bacteria (*E. coli*). The project starts the implementation of the Spring River Watershed Management Plan, in which the primary objective is to reduce bacterial levels to below the whole body contact level for recreational waters. As proposed in the plan, the project will implement best management practices (BMPs), targeted in areas of possible sources of bacteria pollution occurring from human, agriculture production and livestock operations.

OBJECTIVES

- Implement agricultural and stormwater best management practices (BMPs)
- Develop educational outreach projects that increased local landowners knowledge of cost-share programs
- Educate local landowners about the benefits of implementing BMPs to protect water quality.
- Host several public landowners meetings to discuss BMPs programs and installation
- Educate the local youth and future farmers about new methods of water quality protection.
- Provide modeling and monitoring of BMPs throughout the entire watershed.

METHODS EMPLOYED

- ✓ Conduct storm water drain stenciling
- ✓ Implement urban rain garden and rain barrel demonstrations and field days
- ✓ Install on-site septic systems and remediation cost-share practices
- ✓ Conduct Stream Team monitoring activities
- ✓ Implement yearly water festivals
- ✓ Hold public meetings
- ✓ Install riparian BMP cost-share practices
- ✓ Conduct load reduction modeling for preserved or enhanced riparian corridors
- ✓ Conduct water quality monitoring and reporting
- ✓ Yearly nonpoint source pollution load reduction reporting
- ✓ Quarterly Reports, Annual Report and Final Report
- ✓ Install project signs on demonstration sites

COOPERATING AGENCIES

University of Missouri Extension, Jasper County Health Department (JCHD), Jasper-Newton Environmental Taskforce, Jasper County SWC, Missouri Department of Natural Resources, NRCS, Southwest Ozarks Stream Teams, city of Carthage, Missouri Department of Conservation, and Jasper County Watershed Partnership

CONTACT

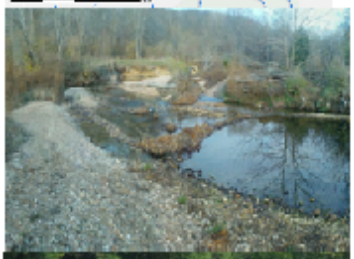
Project Manager: Tony Moehr,
JCHD Administrator
Authorized Representative: Jim Honey,
Eastern District Commissioner
Jasper County Commission
105 Lincoln, Carthage, MO 64836
(417) 358-0480
moehra@lpha.mopublic.org

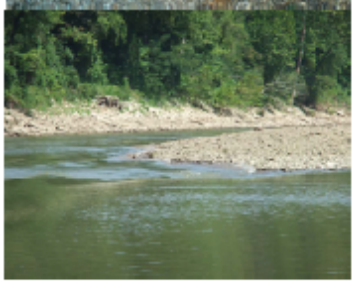
MDNR Project Manager: John Johnson
Grant #: G12-NPS-04
Project Period: April 15, 2012 – April 14, 2014
FY08-09 319 Grant: $331,068
Match: $197, 679 *
Total funding: $553,740

*Remaining $25,000 match is provided through funds generated from the Missouri Parks and Soils Sales Tax

G12-NPS-07

Keifer Creek Watershed Management Plan (WMP)
HUC# 07140102





PROJECT DESCRIPTION
This project will develop a Watershed Management Plan (WMP) for the Keifer Creek sub-watershed, located in southwestern St. Louis County. To develop the watershed plan, the Missouri Coalition for the Environment will use a planning process that encourages local stakeholder participation and support. This process will involve multiple steps and technical expertise to address all nine critical elements involved in the planning process.

OBJECTIVES
The overall goal of the Keifer Creek WMP is to understand the quantity and location of pollution sources; to determine a pollution loading reduction goal that can be achieved by nonpoint source management measures; to develop an implementation plan to achieve the pollution loading reduction goal; to propose a plan to monitor water quality during and after prospective implementation of nonpoint source management measures; to craft a strategy for funding the proposed implementation plan, and to achieve all of this through a planning process that engages community members, partners and stakeholders.

METHODS EMPLOYED
- ✓ Use a planning process that encourages local stakeholder participation and support.
- ✓ Stakeholder public meetings will be held to identify watershed problems, major pollutant sources, and management measures to be implemented.
- ✓ Draft watershed management plan will be presented to both technical and advisory committees and the general public before finalizing.
- ✓ WMP planning committee will meet on a regular basis to review data.
- ✓ Project Manager will oversee the project, providing oversight and organizing technical expertise where needed.
- ✓ Compile and evaluate existing water quality and flow data.
- ✓ Review existing water quality management studies.
- ✓ A stakeholder committee will be formed that is comprised of a wide variety of interested groups within the watershed that includes concerned citizens, business people, conservation agencies and organizations, community service groups, and city and county governments.
- ✓ Quarterly, Annual, MBE/WBE, and Final Reports and invoices.
- ✓ Website, newsletter/newspaper articles, Public Service Announcements.
- ✓ Presentations to interested public/private/governmental entities.

COOPERATING AGENCIES
Missouri Department of Conservation
Missouri Department of Natural Resources
Metropolitan St. Louis Sewer District
East-West Gateway Council of Governments
St. Louis University
Washington University
Local municipalities
Webster University

CONTACT
Project Manager: Lorin Crandall
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Missouri Coalition for the Environment
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MDNR Project Manager: John Johnson
Subgrant #: G12-NPS-07
Project Period: July 1, 2012 - November 30, 2014

FY08-09 319 (Base) Grant:	$10,000
Match:	$20,004
Total funding:	$50,004

G12-NPS-13

Branson Storm Drain Marking Project to Reduce Nonpoint Source Pollution

HUC # 11010003

PROJECT DESCRIPTION

The Branson Storm Drain Marking project will install 750 stainless steel markers on storm drains in the highly visible Branson Landing area in the Branson Missouri. The project goal is to raise awareness of the importance of preventing nonpoint source pollution and educate citizens on how their daily activities can has an impact on water quality in their community and Lake Taneycomo. The city will provide GIS training to a local intern so a database can be developed to map and track the marker program progress. Public awareness of alternative measures to prevent nonpoint source pollution will be raised through media coverage in multiple outlets including television, radio and newspaper interviews. A web page will also be developed to inform citizens about the storm drain program and provide water quality information for the general public use.

OBJECTIVES

- Acquire and input GIS data on additional 750 storm drains. Intern trained and supervised by the city GIS/Mapping Coordinator.
- 20% of the city's storm drain system currently mapped (871 inlets). An additional 20% of system will be added to GIS database using interns.
- Generate city map of which storm drains are currently in GIS database, including which have been marked with decal.
- Inform community of storm drain decals purpose and links to nonpoint source pollution (2 radio interviews, 2 news releases, 2 news articles).
- Provide opportunity for at least 50 or more citizen to participate in storm drain decal project. Install 750 storm drain decals.
- Create webpage on city of Branson website detailing use of storm drain markers and informing of nonpoint source pollution.

METHODS EMPLOYED

- ✓ Generate public awareness of alternatives to prevent nonpoint source through media coverage in multiple outlets
- ✓ Install 750 storm drains markers
- ✓ Distribute door hang tags throughout the project area with a phone number for questions
- ✓ Develop a notebook documenting project planning, budget, activities and supplies
- ✓ Create a nonpoint source pollution/stormwater web page on city of Branson website
- ✓ Develop GIS database and a map to track the storm drain marking project progress
- ✓ Conduct 2 radio interviews
- ✓ Develop 2 news releases and 2 news articles
- ✓ A photo journal will be kept as part of the reporting, evaluation and website updates

COOPERATING AGENCIES

City of Branson, Boy Scouts, Table Rock Lake Water Quality Inc., Girl Scouts Troop, James River Basin Partnership, and Branson Landing area communities

CONTACT

Project Manager: Mona Menezes
Authorized Representative: David Miller
Director of Engineering & Public Works
City of Branson, MO
110 Maddux Ste. 310
Branson, MO 65516
mmenezes@bransonmo.gov
(417) 337-8566

MDNR Project Manager: John Johnson
Minigrant #: G12-NPS-13
Project Period: May 1, 2012 – April 30, 2014

FY08-09 319 Grant:	$3,819
Match:	$2,546
Total funding:	$6,365

G12-NPS-14

Pride of Stride
HUC #07110002

PROJECT DESCRIPTION
The "Pride of Stride" project in Scotland County will aid in addressing water quality problems on the Scotland R-1 school ground, increase awareness and knowledge of environmental issues and teach about native plants that can be used to mitigate nonpoint source pollutants. The project will design and implement best management practices (BMPs) to address the gully and erosion problems along the trail and school ground areas. The BMPs will be used as a demonstration to educate students and the local community about nonpoint source erosion.

OBJECTIVES
1. Reduce soil erosion by using rip rap, tile and gravel to stop gully and most of the rill erosion in the highly visible area of the community and school grounds before it enters Guinn's Branch.
2. Use the BMP demonstration site as an outdoor classroom for 50 students.
3. Implement classroom lessons on watershed and BMPs to one Vocational Agriculture class.
4. Build awareness in Scotland County of the relationship between nonpoint source pollution and BMPs.
5. Increase walking traffic to the demonstration site and walking trail by 20%.

METHODS EMPLOYED
- ✓ Design and implement BMPs to address the gully and rill erosion problems
- ✓ Use geotextile fabric to tier and gravel the existing drainage ditch by dry hole structure
- ✓ Tile areas between the playground and riparian area to stop the washing from parking lot runoff
- ✓ Use geotextile along walking trail at sediment basin to prevent erosion
- ✓ Use native plant species around the edge of the sediment basin, to filter pollutants
- ✓ Use RUSLE2 to calculate gully erosion and determine soil loss
- ✓ Demonstration signage will be developed and placed in visible locations on the project site
- ✓ Develop and distribute teaching curriculum for two Vocational Agriculture and Science teachers.
- ✓ Increase communities awareness of nonpoint source pollution through newsletter and radio releases
- ✓ Implement pre- and post-survey
- ✓ Complete visual site assessment with pre- and post-pictures of the project site
- ✓ Use pre- and post-tabulation (counter method) to determine the percentage increase in traffic at site.

COOPERATING AGENCIES
Missouri Department of Natural Resources, University of Missouri Extension, Natural Resources Conservation Service, Missouri Department of Conservation, Scotland R-1 School, Tiger Team Trail Committee, Fabius Master Gardeners, Scotland County Commission, Scotland County Soil and Water Conservation District (SWCD)

PROJECT SPONSOR
Project Manager: Darla Campbell
University Missouri Extension
Authorized Representative: Duane Elbeling
Board Chairman
Scotland County SWCD
RR 1 Box 73G
Memphis, MO 63555
campbelld@missouri.edu
(660) 457-3469

MDNR Project Manager: John Johnson
Minigrant #: G12-NPS-14
Project Period: April 15, 2012 – April 14, 2014

FY08-09 319 Grant:	$10,000
Match:	$6,667
Total funding:	$16,667

G13-NPS-05

Schuyler County Well Decommissioning
HUC #07110002

PROJECT DESCRIPTION

The Schuyler County Well Decommissioning project will implement an informational effort to educate the citizens in Schuyler County about ground water contamination that may occur from pollutants entering abandoned water wells that have not been properly closed. Schuyler County Soil & Water Conservation District (SWCD) will produce newsletters, news releases, trifold display, and implement a best management practice (BMP) demonstration, illustrating the proper procedure used to decommission old wells. Overall goal is to get 20 landowners with abandoned wells on their property to properly decommission them through a cost-share incentive program.

OBJECTIVES

- Hold a well decommissioning demonstration to encourage landowners to locate and fill open and unused wells on their property.
- To decommission 20 unused or abandoned wells in Schuyler County through a cost-share program.
- To encourage residents of Schuyler County through newsletter and displays to decommission wells even if no cost-share is available.

METHODS EMPLOYED

- ✓ Cost-share assistance will be provided to landowners to decommissioning 20 abandoned wells.
- ✓ Information/Education - The project and well decommissioning information be provided in the county newspaper and Schuyler County Extension "AGBEAT" newsletter.
  - ✓ A tri-fold display showing well decommissioning will be setup in SWCD office for landowner to view.
- ✓ A well decommissioning demonstration will be held for landowners
- ✓ NRCS will provide design and practice certification
- ✓ University of Missouri Extension will help administer the grant and conduct well decommissioning educational efforts
- ✓ MDC-Private Land Conservationist will help promote the cost-share program
- ✓ **Schuyler County SWCD** will provide a district technician to do the well measuring and design and district manager for assistance with paperwork for site approval, cost- share, and DNR registration.

COOPERATING AGENCIES

University of Missouri Extension, Natural Resources Conservation Service (Schuyler and Putnam counties), Missouri Department of Conservation (Scotland, Schuyler, and Putnam counties), and Schuyler County SWCD

CONTACT

Project Manager: Darrell L. Kearse
Schuyler County SWCD
P.O. Box 249
Lancaster, Missouri 63548
(660) 457-3715
Darrell.kearse@swcd.mo.gov

MDNR Project Manager: John Johnson
Minigrant #: G13-NPS-05
Project Period: September 15, 2012 – September 14, 2014

FY08-09 319 Grant:	$10,000
Match:	$6,667
Total funding:	$16,667

G08-NPS-01

Jefferson Farms Water Quality Demonstration Project
HUC 10300102

PROJECT DESCRIPTION

The project is located in the Hinkson creek watershed, which is approximately 57,500 acres, and is currently on the state's 303(d) list of impaired waters. This project focuses on the development of a 67-acre farm. The Jefferson Farm site will demonstrate sustainable agriculture practices including livestock pasturing, row crops, specialty crops, and turf grass management.

The newly created Jefferson Farms facility in the Hinkson Creek watershed will showcase a suite of best management practices (BMPs) to reduce surface runoff from urban and agricultural sources. The facility will include a variety of agricultural, horticultural, and conservation components, with an emphasis on environmental-friendly land management. Practices include the use of riparian buffers, constructed wetlands, bioswales, and rain gardens, as well as permeable paving technologies. The indoor facility will include a visitor center with teaching areas, and exhibit hall with interactive exhibits and classrooms. The project will reduce agricultural runoff, demonstrate BMPs, develop and conduct tours, workshops and 5th-grade curriculum, and implement producer education programs in methods to reduce surface runoff. The 319 funding will be used to install and monitor BMPs to reduce erosion and chemical runoff from pesticides, fertilizers and animal wastes.

OBJECTIVES

1. To reduce runoff from public parking surfaces through the demonstration of permeable pavement, bioswales and (2) rain gardens.
2. To reduce agricultural runoff from cropland and pasture areas through use of constructed wetland buffers, vegetative covers and riparian buffers with grass filter strips.
3. To conduct extensive public education programs on water quality, incorporating site demonstrations, tours, workshops and youth curricula.
4. To implement producer education programs to train farmers and other landowners in methods of improving water quality through reduced surface runoff.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan development
- ✓ Samples in post-rainfall periods and analyzing water samples for nutrients and other factors
- ✓ Electronic copy of raw data submitted to MDNR
- ✓ Installation of two (2) rain gardens
- ✓ Parking lot construction using Advanced Paving System brick pavers
- ✓ Wetland development and buffers
- ✓ Construct overflow parking lot using a combination of permeable asphalt and grasspavers
- ✓ Quarterly, Annual and Final Reports
- ✓ 2 rain gardens
- ✓ Written and verbal surveys to evaluate success
- ✓ BMP tours

CONTACT

Project Manager: Lorin Chann
Authorized Representative: Dr. Jerry Nelson
Thomas Jefferson Agricultural Institute
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Columbia, MO 65203
(573) 449-3518
lchann@jeffersoninstitute.org

MDNR Project Manager: John Johnson
Subgrant #: G08-NPS-01
Project period: February 15, 2008 – January 21, 2013

FY06 319 Grant:	$188,000
FY02 319 Grant:	$78,000
Match:	$182,000
Total funding:	$448,000

G08-NPS-06

North Fabius Water Quality Improvement Project
HUC #07110002

PROJECT DESCRIPTION
This North Fabius Water Quality Improvement project is addressing the three main water quality problems in the North Fabius River watershed: sediment, chemical runoff, and animal waste. The main sources of sediment here are unimproved pastures, cropland, and streambank erosion caused by livestock watering. Chemical inputs are primarily from conventional cropland or commercial horticulture operations; animal waste sources include cattle in the stream, feedlots, and a 2400-head confined hog feeding operation.

OBJECTIVES
- Reduce sheet and rill erosion and control pests on cropland.
- Demonstrate stream water quality benefits by manure distribution and maintain vegetative cover on pastureland.
- Demonstrate water quality and soil conservation benefits by excluding livestock from streams through the construction alternative watering sources and livestock use exclusion areas.
- Reduce erosion by decreasing sediment, nutrient, and chemical runoff through the installation of riparian vegetative buffers.
- Reduce sediment delivery into the river and its tributaries by construction of terraces and dry hole systems/sediment basins.
- Reduce chemical and animal waste runoff through proper application of lime and fertilizer.
- Control animal waste runoff and increase infiltration.
- Reduce streambank erosion by demonstrating spring developments.
- Prevent groundwater contamination by decommissioning abandoned water wells.
- Incorporate information from best management practice (BMP) implementation into the watershed management plan.

METHODS EMPLOYED
- ✓ Use RUSLE2 model to estimate BMP soil loss
- ✓ Collection of water quality samples from the North Fabius River
- ✓ Use educational events to document public knowledge and interest in nonpoint source pollution and water quality
- ✓ Surveys and evaluation participants and attendees at demonstrations and workshops
- ✓ Implement a landowner/participant survey to gauge increase in knowledge of water quality
- ✓ Install 11 alternative watering sources/use exclusion system
- ✓ Decommission 25 abandon wells
- ✓ Install 10 miles of riparian buffers
- ✓ Completed 4 planned grazing systems
- ✓ Complete 17 dry sedimentation basins
- ✓ Install 1 animal waste facility
- ✓ Quarterly, Annual and Final Reports

COOPERATING AGENCIES
USDA Natural Resources Conservation Service, University of Missouri-Columbia Extension, Missouri Stream Team

CONTACT
Project Manager: Darla Campbell
University of Missouri Extension
Authorized Rep: Edgar Berry, Chairman
Schuyler County Soil & Water Conservation District
P.O. Box 249
Lancaster, Missouri 63548
(660) 457-3469

MDNR Project Manager: John Johnson
Subgrant # G08-NPS-06
Project Period: March 1, 2008 – January 31, 2013

FY06 319 Grant:	$477,162
Match:	$ 0
Total Funding:	$477,162

G08-NPS-14

Northwoods - Baden Creek Bank and Water Quality Stabilization
HUC # 11010002

PROJECT DESCRIPTION

The Baden sub-watershed encompasses 426.3 acres in the city of Northwoods located in north St. Louis County. Baden Creek has been the site of nonpoint source pollution in the form of sedimentation from creek bank erosion and storm water runoff. The project is evaluating the existing conditions of the stream to generate recommendations for improvements to Baden Creek to reduce erosion, improve water quality, control localized flooding where possible, and educates citizens on the destructive nature of nonpoint source pollutants on the creek environment and to residential property. The project has completed a detailed assessment of the stream and conducted a geomorphic study to identify the areas where best management practices (BMPs) are needed to improve the stream water quality. Storm water and stream stabilization practices are being implemented in the critical areas of the watershed

OBJECTIVES

- Complete a geomorphic study to determine specific stream problems and identify practical solutions
- Implement education programs to educate the local residents about nonpoint source and water quality
- Implement stream and storm water BMPs in the critical area of the watershed
- Increase by 20% resident participation in implementing storm water BMPs
- Hire a Project Manager to coordinate implementation of all aspects of the Baden Creek Project
- Promote riparian buffer and/or vegetative filter strip along Baden Creek where appropriate

METHODS EMPLOYED

- ✓ Complete a geomorphic study of Baden Creek
- ✓ Implementation of practical resolutions where the worst stream problems are occurring
- ✓ Develop a project website and newsletter
- ✓ Implement a telephone announcement system
- ✓ Hold Town Hall meetings for the residents
- ✓ Install "Resident Participation" Yard Signs on participating residents
- ✓ Conduct an annual evaluation of sedimentation reduction and creek bank erosion
- ✓ Develop quarterly, annual and final reports of 319 project results

COOPERATING AGENCIES

Metropolitan St. Louis Sewer District, Missouri Department of Conservation, St. Louis County Health Department, Reitz and Jens, Inc., Intuition and Logic, St. Louis University-Region Wise College of Public Service

CONTACT

Project Manager: Lillian D. Eunice
City Administrator
Authorized Representative:
Rev. Everett Thomas, Mayor
City of Northwoods
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Northwoods, Missouri 63121
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E-Mail: leunice@cityofnorthwoods.com

MDNR Project Manager: John Johnson
Subgrant: # G08-NPS-14
Project period: April 1, 2008 – July 14, 2013
FY06 319 Grant: $ 611,321
Match: $ 407,568
Total funding: $1,018,889

G09-NPS-03

Upper Shoal Creek On-Site System Implementation
HUC 11070207

PROJECT DESCRIPTION

The Upper Shoal Creek On-Site System Implementation Project is targeting homeowners nearest Shoal Creek and its tributaries to carry out septic system clean-outs, repairs, and replacement practices. Interested parties within the target area, receives an assessment of their on-site system to identify problems and determine which practice should be conducted. Homeowners are also advised on other practical best management practices (BMPs) (e.g., livestock exclusion, manure handling) to implement on their property. Each homeowner that participates in the repair, replacement, and pump-out programs will have the opportunity to sample their private drinking well water to ensure bacterial contamination has not occurred. A nine (9) element watershed management plan for Upper Shoal Creek will also be developed in the project.

OBJECTIVES

- Complete a 9-element watershed management plan;
- Repair or replace approximately 30 septic systems;
- Pump out 40 septic systems;
- Promote project and educate watershed residents through targeted landowner events, direct mailings, educational materials, newspaper articles, radio programs, community contacts, and annual field demonstration days;
- Provide educational materials to residents in target watershed areas;
- Survey residents to assess knowledge, attitude and behavioral changes;
- Test 50 drinking water wells for bacteria contamination;
- Develop a water quality sampling plan and Quality Assurance Project Plan;
- Monitor water quality of the Upper Shoal;
- Develop a GIS database to track water quality and BMPs; and
- Report load reductions for bacteria.

METHODS EMPLOYED

- ✓ Targeted landowner meetings
- ✓ Homeowner site assessments
- ✓ Pre- and post-surveys
- ✓ On-site system repair
- ✓ and replacement
- ✓ On-site system pump-outs
- ✓ Bacterial tests on drinking water wells
- ✓ Community outreach
- ✓ Distribute educational materials through meetings and community contacts
- ✓ Volunteer water quality monitoring
- ✓ Quarterly, Annual and Final Reports
- ✓ Homeowner/ participants will sign septic system maintenance agreements

COOPERATING AGENCIES

- ✓ Missouri Department of Natural Resources – CSI Volunteer Water Quality Monitoring
- ✓ Missouri Department of Conservation
- ✓ Wheaton FFA Stream Team
- ✓ Barry County Health Department
- ✓ Grand Lake O' the Cherokees Watershed Alliance Foundation

CONTACT

Project Manager: Drew Holt
Authorized Representative: Dr. Eugene Miekley
Shoal Creek Watershed Improvement Group
PO Box 6, Pineville, MO 64856
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HoltDM@missouri.edu

MDNR Project Manager: John Johnson
Subgrant #: G09-NPS-03
Project Period: November 1, 2008 – December 31, 2012

FY05 319 Grant:	$29,600
FY07 319 Grant:	$195,000
Match:	$149,741
Total funding:	$224,600

G09-NPS-07

Upper Big River Water Quality Project

HUC 07140104

PROJECT DESCRIPTION

The two main goals of this project are to provide an opportunity, through technical and financial assistance, for landowners in the Upper Big River watershed to improve stream conditions; and create an opportunity to educate landowners and citizens within the watershed about water quality problems in the river and aquifer, sources of impaired water quality, and solutions. These goals will be accomplished through establishing of a steering committee, finalizing the Upper Big River Watershed Management Plan, decommissioning abandoned mineral exploration test holes, building alternative watering systems, fencing out forested areas, establishing riparian forest buffer, preserving and excluding livestock from stream, modeling water quality improvements, calculating pollutant load reductions, and promoting the goals and successes of this project through field days, annual meetings, informational public meetings, presentations, newsletters, publications, other public events, and media outlets.

OBJECTIVES

- Hire staff to complete stated objectives
- Establish steering committee to guide staff
- Finalize the Upper Big River Watershed Management Plan
- Decommission 1300 abandoned mineral exploration test holes within the Big River watershed
- Exclude livestock from the areas around flowing mineral test holes
- Improve timber management through livestock exclusion
- Establish 12 acres of riparian forest buffer/vegetative filter strip along the river
- Preserve and exclude livestock from 4 miles of stream buffers along the river
- Label good demonstrations of best management practices through strategically located signs
- Calculate pollutant load reductions on best management practices
- Develop "before and after" photos of installation of best management practices (BMPs)
- Promote successes of this project through field days, annual meetings, informational public meetings, presentations, newsletters, publications, other public events, and media outlets (e.g., radio)

METHODS EMPLOYED

- Event and meeting agendas, presentations and associated educational materials
- Memorandum of Understanding(s)
- Public outreach materials
- Quarterly submission of data
- Load reductions calculations
- Cost-share and maintenance agreements
- Photo journal
- Media coverage, such as articles
- Quarterly, annual, MBE/WBE, invoice, and final reports, as required

CONTACT

Project Manager: Kenny Gilliam
Authorized Representative: James Plummer, Board Chairman
St. Francois County SWCD
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MDNR Project Manager: John Johnson
Subgrant #: G09-NPS-07
Project Period: June 1, 2009 – May 31, 2013

FY04 319 Grant	$ 70,000
FY07 319 Grant	$880,000
Match:	$ *
Total funding:	$950,000

* Non-Federal Match will be provided by the Missouri Parks and Soils Sales Tax.

G09-NPS-11

James River Basin Riparian Corridor Restoration and Protection
HUC # 11010002

PROJECT DESCRIPTION
The project is establishing riparian corridors and preserving existing corridors by utilizing conservation easements. A riparian corridor assessment, conducted by the Missouri Department of Conservation (MDC), is being used to identify high quality and poor quality riparian areas that the James River Basin Partnership(JRBP) can target for the easement program. Although the total James River watershed will be addressed, priority and targeted efforts will be given to two subwatersheds, Middle James River and Finley River sub-watersheds.

OBJECTIVES
- Develop and implement a riparian conservation easement program
- Retain 20 miles of riparian corridor systems in the conservation easement program
- Enhance or establish 10 miles of riparian corridor systems in high priority areas
- Create an educational program for riverfront property owners on managing and protecting their corridor systems
- Create a model riparian buffer ordinance and present to city and counties officials within the James River Basin

METHODS EMPLOYED
- ✓ Complete 10 miles of corridor restoration/enhancement implementation
- ✓ Complete 20 miles of corridor preservation
- ✓ Conduct 8 riparian corridor and stream dynamics workshops
- ✓ Develop a detailed information packet related to conservation easement opportunities
- ✓ Develop a model corridor buffer ordinance
- ✓ Conduct load reduction modeling for preserved or implemented/enhanced corridors
- ✓ Expansion on MDC 2008 corridor assessment and target other areas of the JRB
- ✓ Conduct a riparian corridor conservation easement program
- ✓ Develop a riverfront property owners guide for landowners
- ✓ Complete a yearly nonpoint source pollution load reduction report
- ✓ Quarterly Reports, Annual Report, MBE/WBE Report and Final Report

COOPERATING AGENCIES
Missouri Department of Conservation; Greene County SWCD; City and County Planning and Zoning: Christian, Greene, Ozark and Nixa; Watershed Committee of the Ozarks; Table Rock Lake Water Quality Inc.; Upper White River Basin Foundation; NRCS South Missouri Water Quality Project; Finley River Committee.

CONTACT
Project Manager: Joe Pitts
Authorized Representative: Janice Greene, President
James River Basin Partnership
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JoePitts@MissouriState.edu

MDNR Project Manager: John Johnson
Subgrant #: G09-NPS-11;
Project period: May 15, 2009 – July 31, 2013

FY03 319 Grant:	$37,000
FY07 319 Grant:	$563,000
Match:	$400,020
Total funding:	$1,000,020

G09-NPS-12

Town Branch of Piper Creek Watershed Management Plan

HUC #10290107

PROJECT DESCRIPTION

This project developed a Watershed Management Plan (WMP) for the Town Branch of Piper Creek sub-watershed in Polk County, Missouri. To develop the plan, the Bolivar Community Watershed Improvement Group (BCWIG) used a planning process that encourages local stakeholder participation and support. The plan was constructed with local buy-in and support from a variety of partners.

OBJECTIVES

The main objective of the project is to develop a WMP that would aid in restoring the water quality of Town Branch of Piper Creek to the highest practical level and improve the quality of the water in the stream to equal or exceed the water quality standard set by the Missouri Department of Natural Resources for Town Branch.

METHODS EMPLOYED

- BCWIG will administer the grant, facilitate all meeting, provide water quality education materials and facilitate collaboration between partners.
- A technical committee aided in developing the WMP.
- Stakeholder public meetings were held to identify watershed problems.
- Twelve (12) education programs were implemented in the Town Branch watershed.
- A consultant was contracted to assist with data collection, data entry and plan development and drafting.
- Watershed Management Plan developed.
- Technical Committee meetings held.
- Educational materials developed.
- Quarterly Reports, Annual Report, MBE/WBE and Final Report.

COOPERATING AGENCIES

Partners in the project include the Bolivar Community Watershed Improvement Group, city of Bolivar, Polk County, Polk County Soil and Water Conservation District, Natural Resources Conservation Service and University of Missouri Water Quality Program.

CONTACT

Project Manager: Larry Ferguson
Authorized Representative: Delbert Simpson
Bolivar Watershed Improvement Group
2101 E. Thornridge Dr.
Bolivar, MO 65251
(417) 326 - 4527

MDNR Project Manager: John Johnson
Subgrant #: G09-NPS-12
Project period: September 1, 2008 – December 31, 2011

FY05 319 Grant:	$15,000
Match:	$10,000
Total funding:	$30,000

G10-NPS-08

Stream Care for Landowners
HUC # 10300102

PROJECT DESCRIPTION
The Stream Care for Landowners project is an information/education project, implemented to increase the awareness and knowledge of streamside landowners on the proper maintenance, placement, effectiveness, and environmental benefits of erosion control best management practices (BMPs). The project assisted with improving environmental conditions by reducing nonpoint source pollution in the forms of erosion and stream sediment through BMP installation.

OBJECTIVES
1. Increase awareness and knowledge about proper construction placement, effectiveness, cost and environmental benefits (i.e., reduction of concentrated flow, velocity, erosion, and other NPS benefits) of stream management BMPs.
2. Increase the acceptibility and use of BMPs that address stream problems.
3. Reduce channel erosion and sedimentation and empower landowners with the tools and knowledge to address stream erosion problems.

METHODS EMPLOYED
- ✓ Three (3) workshops were held to inform and educate local landowners on proper installation and BMP maintenance
- ✓ The project manager and Professional Engineer worked with landowners with streambank problems on their property to evaluate and establish suitability for BMP placement and demonstration sites
- ✓ City engineer designed and oversee the BMP construction
- ✓ Fliers and handouts distributed during educational
- ✓ Two (2) public field days
- ✓ One stream care guide pamphlet developed
- ✓ Pre- and post survey
- ✓ 3 Stream BMP Demonstration
- ✓ 2 Field Day
- ✓ Stream Table
- ✓ 3 Demonstration signs

COOPERATING AGENCIES
Missouri Department of Natural Resources, University of Missouri-Columbia, Natural Resources Conservation Service, Farm Service Agency, Missouri Department of Conservation (MDC), US Corp of Engineers, Greenbelt Land trust, Missouri Petroleum, ASP Enterprises, City of Columbia

CONTACT

Project Manager: Georganne Bowman
Authorized Representative: Kenneth M. Pearson,
Presiding Commissioner
Boone County Public Works
Stormwater Management Program
5551 Highway 63 South
Columbia, MO 65201
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GBowman@boonecountymo.org

MDNR Project Manager: John Johnson
Subgrant #: G10-NPS-08
Project period: August 1, 2010 – January 31, 2012

FY08-09 319 Grant:	$9,700
Match:	$ 6,575
Total funding:	$16,275

G11-NPS-10

Boulevard Park Rain Garden and Bioretention System Demonstration Project

HUC # 07110009

PROJECT DESCRIPTION

The project implemented an educational effort to familiarize local citizens with storm water practices that meets the city of Lake Saint Louis, Missouri, new storm water engineering standards and address water quality problems. A bioretention system and rain garden demonstration were constructed that will be used to educate local developers, homeowners, volunteer organizations and students about nonstructural best management practices. An informational Kiosk display was installed at the demonstration sites to be used in presentations and public outreach events. Other educational activities implemented included two student field days, one public workshop and the development of three storm water fact sheets. The primary audiences for the project include the development community, local residents and students of Green Tree Elementary School.

OBJECTIVES

1) Demonstration of Bio-retention System, a preferred water quality measure for new developments and retrofits to existing stormwater systems.
2) Demonstration of a Rain Garden, a less expensive and widely applicable tool for residential storm water treatment and minor nuisance abatement
3) Public education on water quality treatment techniques
4) Improved habitat at Boulevard Park in Lake Saint Louis
5) Bring together city staff with local developers, homeowners, volunteer organizations, and students

METHOD EMPLOYED

- Construct a bio-retention system and rain garden practice demonstrations adjacent to a large parking lot in Boulevard Park
- Implement two student educational field days and one adult workshop
- Conduct two local stakeholder meetings
- Develop three fact sheets to help educate the local communities on both demonstration practices (bio-retention system and rain garden)
- Installed two informational kiosk displays on the demonstration site

COOPERATING AGENCIES

Confluence Chapter of the Missouri Master Naturalists
St Charles County Soil and Water Conservation District
Lake Saint Louis Green Environmental Advisory Committee
Green Gloves

CONTACT

Project Manager: Maria G. King
Authorized Representative: Paul Markworth
City Administrator
City of Lake Saint Louis
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Lake Saint Louis, MO 63367
(636) 695-4221
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MDNR Project Manager:
John Johnson
Minigrant #: G11-NPS-10
FY08-09 319 Grant:
$10,000
Project Period:
February 15, 2011 – September 30, 2012
Match: $6,672
Total funding: $16,672

G11-NPS-18

Lower Dardenne Creek Watershed Management Plan Project
HUC #07110009

PROJECT DESCRIPTION
This project will develop an Environmental Protection Agency (EPA) 9-element Watershed Management Plan (WMP) for the Lower Dardenne Creek watershed, focusing on Spencer Creek, which is a major tributary to the Dardenne located within the municipal boundary of the city of St. Peters, Missouri. The plan will be developed to help protect and improve water quality in the watershed by identifying pollutant sources, identifying better management practices, setting reachable goals and a timeline for implementation projects, and establishing an evaluation and monitoring program. The Lower Dardenne Creek plan will provide a blueprint for projects and best management practices to address storm water problems, reduce pollutant loading, and improve water quality. The Spencer Creek WMP will be coordinated with a larger storm water management plan to be conducted for all watersheds within St. Peters that flow to Dardenne Creek.

OBJECTIVES
1. Protect and improve water quality in the watershed and Big Creek by identifying pollutant sources and gathering pertinent data.
2. Identify conservation practices to be implemented.
3. Set realistic goals and timeline for implementation.
4. Establish an evaluation and monitoring program to determine success of implemented projects/programs.
5. Increase success of future water quality projects.
6. Help determine where water quality efforts should be focused.
7. Fulfill specific grant application requirements for securing future funding.
8. Provide insight for creation of more efficient implementation and/or education budgets for future projects.

METHODS EMPLOYED
- ✓ Development of a WMP
- ✓ A watershed group will be formed to assist with the watershed planning efforts
- ✓ Schedule and host advisory and stakeholder meetings, and maintain communication with committees, stakeholders, and the public
- ✓ Promote the WMP by using the City's newsletter, local cable TV and website
- ✓ Hire a consultant to conduct water quality monitoring and modeling
- ✓ Public/stakeholders meetings
- ✓ Watershed group collaboration, input and meetings
- ✓ Factsheets, news releases and news articles
- ✓ Local cable TV spots and website information
- ✓ Quarterly, Annual, MBE/WBE, and Final Reports

COOPERATING AGENCIES
CBL and Associates Properties; Great Rivers Greenway District; U.S. Army Corps of Engineers; St. Charles County; the cities of St. Peters, St. Charles, O'Fallon, Dardenne Prairie and Cottleville; and St. Charles County Soil and Water Conservation District.

CONTACT
Project Manager: Russell Batzel
Authorized Representative: William Charnisky
City Administrator
City of St. Peters
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MDNR Project Manager: John Johnson
Watershed Management Plan Grant #: G11-NPS-18
Project Period: July 15, 2011 – July 14, 2013
FY08-09 319 Grant: $30,000
Match: $27,000
Total funding: $57,000

G11-NPS-19

Watkins Creek Watershed Management Plan
HUC #07140101

PROJECT DESCRIPTION
Watkins Creek watershed is located in northeastern St. Louis County in a suburban area of mixed residential, commercial, and light industrial land use. The project will develop a Watershed Management Plan (WMP) for the Watkins Creek sub-watershed. To develop the plan, Greenway Network, Inc. will use a planning process that encourages local stakeholder participation and support. The WMP will include EPA's nine critical planning elements, which includes the development of public education, pollution reduction (including modeling to show load reduction), development of a water quality monitoring program and water quality parameters, identifying implementation actions with a scheduled timeline, and proposed funding for mitigating pollutant sources.

OBJECTIVES
1. Protect and improve water quality in Watkins Creek by identifying pollutant sources and gathering pertinent data.
2. Identify conservation practices to be implemented.
3. Set realistic goals and a timeline for implementation.
4. Establish an evaluation and monitoring program to determine success of implemented projects/programs.
5. Increase success of future projects.
6. Help determine where water quality efforts should be focused.
7. Fulfill specific grant application requirements for securing future funding.
8. Assist other organizations and municipalities in water quality related efforts.
9. Provide insight for creation of more efficient implementation and/or education budgets for future projects.

METHODS EMPLOYED
- ✓ Watershed Management Plan development
- ✓ Conduct several planning meetings
- ✓ Develop newsletters
- ✓ Develop news releases
- ✓ Identify community storm water BMPs
- ✓ Develop a Quality Assurance Project Plan (department accepted)
- ✓ Implement workshops and trainings
- ✓ Quarterly and Annual Reports
- ✓ Monitoring reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES
The Confluence Project, Missouri American Water Company, Metropolitan St. Louis Sewer District (MSD) and East-West Gateway Council of Governments

CONTACT
Project Manager: Ralph Rollins
Authorized Rep.: Charlene Waggoner, President
Greenway Network, Inc.
215 Indacom Dr.
St. Peters, MO 63376
(636) 441-1500
rrollins@mail.win.org

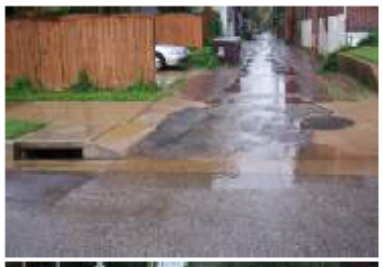
MDNR Project Manager: John Johnson
Subgrant #: G11-NPS-19
Project Period: June 1, 2011 – June 30, 2012

FY08-09 319 Grant:	$15,000
FY04 319 Grant:	$4,175
Match:	$13,650
Total funding:	$32,825

G11-NPS-20

Tower Grove Heights Urban Green Alley Project
(HUC) 071401010506

PROJECT DESCRIPTION
The Tower Grove Heights Urban Green Alley project purpose is to reduce nonpoint source polluted storm water runoff to the urban River des Peres Watershed and Mississippi River from three specific city block alleys by replacing the existing surfaces with permeable pavers. The Tower Grove Heights Project will include local educational efforts to promote community use of BMPs in the Tower Grove Heights neighborhood. Residents will become informed about the use of rain barrels, rain gardens, fertilizer use, and recycling.



OBJECTIVES
- Reduce pollution in urban runoff by installing pervious surfaces and other BMPs that reduce storm water runoff so that it does not negatively affect natural habitats of the River des Peres and the Mississippi River;
- Promote more alley conversions to "green" pervious alleys;
- Provide approved signage at the project site to support educational efforts of the low impact development (LID) pervious paver practices;
- Educate residents on BMPs to reduce quantity and improve quality of storm water runoff; and
- Provide information on proper waste disposal to urban households.

METHODS EMPLOYED
- ✓ Professional design and construction of Green Alleys
- ✓ Map and design production
- ✓ News releases in large circulation newspaper
- ✓ NPS-focused educational program
- ✓ Newsletter with NPS water quality emphasis
- ✓ Interpretive signage at Green Alleys
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING PARTNERS
Tower Grove Heights Neighborhood Association
St. Louis Metropolitan Sewer District
Missouri Botanical Garden
East-West Gateway Council of Governments
South Grand Community Improvement District

Contact
Project Manager: Dan Buschmeyer, P.E.
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Buschmey@stlouiscity.com
Authorized Representative: Richard T. Bradley, P.E.;
President Board of Public Service
Department of the President, Board of Public Service
City Hall, Room 305
1200 Market Street
St. Louis, MO 63103-2806
(314) 622-4143

MDNR Project Manager: John Johnson
Subgrant #: G11-NPS-20
Project Period: May 1, 2011 - December 31, 2013

FY08-09 319 (Base) Grant:	$744,000
Match:	$496,000
Total funding:	$1,240,000

G11-NPS-21

Kiefer Creek Watershed Restoration Project
HUC# 07140102

PROJECT DESCRIPTION
The Kiefer Creek Watershed Restoration Minigrant Project will build organizational capacity within the watershed, develop an educational website and produce a mini-documentary about the history and current state of Kiefer Creek.

The project will begin the process of composing a 9-element watershed plan for Kiefer Creek. A series of stakeholders meetings will be held to analyze data, develop strategies and make final decisions regarding the development of a watershed plan. From the local stakeholders, the people who will comprise the foundation of the watershed coalition will emerge to serve as stewards to the Kiefer Creek Watershed into the near future.

OBJECTIVES
The goal of this project is to build local capacity for the restoration and protection of Kiefer Creek. Capacity building objectives of this minigrant include:

- Form a watershed stakeholder committee that facilitates partnerships,
- Introduce watershed planning to stakeholders at regular meetings,
- Develop a Kiefer Creek website, and
- Create a mini-documentary video about Kiefer Creek and watershed planning.

METHODS EMPLOYED
- ✓ Website
- ✓ Public meetings for WMP development
- ✓ Advisory/Technical Committee meetings
- ✓ Mini-documentary
- ✓ Educational curriculum
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES
Missouri Department of Natural Resources – Castlewood State Park
Missouri Department of Conservation
Metropolitan St. Louis Sewer District
East-West Gateway Council of Governments
Open Space Council
Stream Team Watershed Coalition
St. Louis Audubon Society

CONTACT
Project Manager: Lorin Crandall
Authorized Rep: David Lobbig,
President of the Board
Missouri Coalition for the Environment
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St. Louis, MO 63130
(314) 727-0600
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MDNR Project Manager: John Johnson
Subgrant #: G11-NPS-21
Project Period: June 1, 2011 – May 31, 2013
FY08-09 319 Grant: $10,000
Match: $7,008
Total funding: $17,008

G12-NPS-11

Missouri Water-Watch 319 Nonpoint Source Summit
(Statewide Project)

PROJECT DESCRIPTION
The Missouri Stream Team Watershed Coalition (MSTWC) partnered with the Upper White River Basin Foundation (dba Ozark Water Watch) to assist in the planning and implementation of the "Water Watch Week" event. "Water Watch Week" is held annually in Southwest Missouri and includes a variety of activities to promote and improve water resources through environmental educational events and stewardship activities. The event is hosted each year by Ozark Water Watch and local watershed organizations. "Water Watch Week" has a culminating event each year. The proposed mingrant primarily focused on development and implementation of a state-wide 319 Nonpoint Source Summit to be held as part of "Water Watch Week" 2012.

This summit showcased 319 program successes and offer opportunities to discuss challenges to a statewide audience. The target audience will be watershed groups, Stream Teams, cities and counties, educational institutions, soil and water conservation districts, and conservation organizations working on water quality issues across the state.

MoDNR Director, Sara Pauley delivers the keynote address at the 2011 Water Quality Summit

OBJECTIVES
1. To showcase successful 319 programs and publications that have occurred in different parts of the state.
2. Encourage audiences to utilize, recreate, and implement these efforts in their local watershed without having to duplicate tools and efforts; e.g., publications, brochures, promotional items, signage, and visual (websites, PSAs, videos, interactive displays and banners).
3. Obtain media coverage through press releases to reach an approximate viewership/readership of 100,000. The general public will gain increased knowledge of nonpoint source issues with media coverage regarding "Water Watch Week."
4. Create and disseminate "Water Watch Week" promotional publications to an estimated 2,000 individuals.

METHODS EMPLOYED
- ✓ Presentations will showcase successful programs that have occurred through the 319 program.
- ✓ Presenters will discuss the challenges and offer suggestions and guidance to overcome challenges.
- ✓ Showcase a variety of programs that have occurred in different parts of the state.
- ✓ Offer scholarships to attendees that reside outside of the Springfield-Branson Area.
- ✓ MSTWC will work with Ozark Water Watch staff and partners to develop promotional materials and press releases for "Water Watch Week" event.
- ✓ Follow up surveys and questionnaires to all attendees.
- ✓ Required progress and final reports.

COOPERATING AGENCIES
City of Branson, U.S. Army Corps of Engineers, Natural Resources Conservation Service, Missouri Department of Natural Resources, Ozark Water Watch, Table Rock Lake Water Quality Inc., James River Basin Partnership, Watershed Committee of the Ozarks, Elk River Watershed Improvement Association

CONTACT
Project Manager: Holly Neill, Executive Director
Missouri Stream Team Watershed Coalition
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Ozark, MO 65721
(417) 827-4864
Email address: hollyneill@mstwc.org

MDNR Project Manager: Greg Anderson
Project Period: March 15, 2012 – August 1, 2012

FY08-09 319 Grant:	$15,000
Match:	$13,316
Total Funding:	$28,316

Implementing Total Maximum Daily Loads through Locally Developed Watershed Management Plans
(Statewide and Targeted Project)

PROJECT DESCRIPTION

University of Missouri (MU) Extension continues efforts began in an earlier subgrant effort that includes watershed group assistance and development of watershed based plans, in addition to laying a foundation for implementing nonpoint source TMDLs. Special technical assistance is provided in performing watershed assessments, load determinations, load reductions, and prioritizing WMP implementation schedules to ensure that projects implemented will reduce the impairment of the water body. MU Extension is available to assist in other various watersheds that may not be targeted for TMDLs as prioritized by the Department of Natural Resources.

State Training on 9-element plan development

OBJECTIVES

1. **Watershed Planning in TMDL or other priority watersheds.** Work with nonprofits, institutes of higher education, and governmental units to refine and provide detail to the implementation schedule of Department accepted 9-element watershed management plans to prepare applicants for funding under Department Requests for Proposals for 319 grant funded projects.
2. **Assist existing groups** in Department identified priority watersheds with development of nine element watershed plans that are of sufficient quality to be accepted by the Department.
3. **New watershed group formation.** Help to form and foster new watershed groups in priority watersheds as defined and requested by the Department.
4. **Conferences and General Info/Ed.** Provide an annual watershed conference and regional workshops that focus on group experience, planning methodology, and training on watershed planning.

BMP site selection for urban subgrant

METHODS EMPLOYED

- ✓ Ensure technical information provided to watershed planners is based upon sound science.
- ✓ Provide all written materials and presentations to the Department's project manager for review and approval of content and proper credit language.
- ✓ Provide continuing professional guidance and technical support throughout the duration of the project, with timely input to the Department and making necessary modifications as required to the process. Technical support provided will include training and assistance with watershed assessment, critical areas, pollutant load determination, and pollutant load reduction.
- ✓ Promote nine-element watershed planning by identifying existing groups in priority watersheds and assisting with the completion of Department acceptable nine element watershed plans.
- ✓ Help to form and foster new watershed groups in priority watersheds as defined by the Department.
- ✓ Plan and host an annual watershed conference for watershed groups and Department personnel, which highlights watershed planning, related tools and resources, watershed group experiences and suggestions, and appropriate demonstrations and workshops.
- ✓ Host regional workshops that focus on group experience, planning methodology, and training.
- ✓ Complete reporting as required by the Department.

COOPERATING AGENCIES

Missouri Department of Natural Resources and University of Missouri Extension

CONTACT

Project Manager: Bob Broz, Investigator
Water Quality Program
University of Missouri Columbia
205 Agricultural Engineering Building
Columbia, MO 65211
(573) 882-0085
Email address: brozr@missouri.edu

MDNR Project Manager: Greg Anderson
Project Period: March 1, 2011 – February 28, 2013

FY05 and 06 319 Grants:	$197,715
Match:	$131,823
Total funding:	$329,538

G12-NPS-09

St. Louis Earth Day Symposium
(Regional Project)

PROJECT DESCRIPTION

The intent of the St. Louis Earth Day Symposium 319 grant is to provide educational and networking opportunities for local government officials, community leaders, and professionals from diverse backgrounds in the planning and environmental fields. For twelve years the St. Louis Earth Day Symposium has highlighted new ideas and increased discussion about regional water quality/water pollution/stormwater management issues. The St. Louis Earth Day Symposium provides good information and data that is needed to drive successful watershed planning.

OBJECTIVES

1. To share best practices for ecologically sensitive approaches to infrastructure development.
2. To utilize ecologically significant data in local and regional planning.
3. Translate environmental issues and sustainable practices into locally applicable solutions.
4. Watershed planning for improved water quality and ecologically-sound stormwater management.
5. Identify key leadership in applied watershed management research and bring them to St. Louis to share their expertise.
6. Reach representatives of at least 20 local government entities in the greater St. Louis region with practical applications of nonpoint source pollution reducing tools and techniques; reach at least 50 consultants of area governments with technical information that will enhance their ability to deliver stormwater management and pollution-prevention services to local governments.
7. Educate local government officials, developers, and consultants about the importance of reducing nonpoint source pollution.
8. Inspire collaboration among local governments to develop watershed plans and regulations to prevent water pollution.
9. Focus the attention of local governments, developers and the consultants who work with them, on low cost strategies to improve water quality.
10. Encourage creative approaches to address water quality challenges.
11. Engage new attendees in using new technology in their watershed planning.
12. Promote an innovative and diverse vision for watershed-based approaches to policy and planning.
13. Introduce new modeling techniques and processes and new GIS tools for watershed planning.

METHODS EMPLOYED

- ✓ Follow up survey/evaluation to all attendees
- ✓ Polling of the Symposium Planning Committee
- ✓ Internal event report
- ✓ Public event report posted on website
- ✓ Website announcements
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

American Society of Civil Engineers, American Society of Landscape Architects, Greenway Network, Horticulture Co-op of Metro St. Louis, Metropolitan St. Louis Sewer District, Missouri American Water, Missouri Botanical Gardens, Missouri Department of Conservation, Missouri Department of Natural Resources, Missouri Department of Transportation, SCI Engineering, The Confluence, East-West Gateway Council of Governments, U.S. Army Corp of Engineers

CONTACT

Project Manager: Cassandra Hage,
Executive Director
St. Louis Earth Day
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Email address: cassie@stlouisearthday.org

MDNR Project Manager: Greg Anderson
Project Period: March 1, 2012 – February 28, 2014

FY08-09 319 Grant:	$10,000
Match:	$12,915
Total federal funding:	$22,915

G11-NPS-02

Table Rock Lake Area Stormwater Planning and Demonstration Project
Table Rock Lake Water Quality, Inc.; HUCs: Surrounding Table Rock Lake watersheds

PROJECT DESCRIPTION

The combined Table Rock Lake area watersheds in Missouri are approximately 278,000 acres in size and located in Stone, Barry, and Taney counties. This project will help produce public support in addition to a guidance manual for future watershed and water quality protection efforts, including plans for low-impact development options.

OBJECTIVES

1. Promote this planning and demonstration project through a variety of events and through local and digital media.
2. Install at least 26 storm water BMPs with many in highly visible public use areas around Table Rock Lake.
3. Develop a Quality Assurance Project Plan (QAPP) to describe data collection for modeling and mapping.
4. Model nutrient and sediment load reductions using Spreadsheet Tool for Estimating Pollutant Loads (STEPL).
5. Produce an education and guidance/sponsorship program that effectively reaches the local public and creates interest in implementing storm water BMPs.
6. Begin a certificate award program to recognize residents around the lake who implement storm water and other water quality conservation-related BMPs on their property.
7. Develop model ordinances to present to local government.
8. Develop a nine-element WMP for the Lake Taneycomo watershed.

METHODS EMPLOYED

- ✓ Establish steering committees
- ✓ Conduct regular steering committee meetings
- ✓ Distribute educational materials
- ✓ Maintain website
- ✓ News Releases (8)
- ✓ Quarterly newsletters
- ✓ BMP maintenance agreements
- ✓ Map and design BMPs (26)
- ✓ Bid and assist BMP installation (26)
- ✓ Develop model storm water ordinances
- ✓ Field days to BMP demonstration sites (4)
- ✓ Training workshops (4)
- ✓ Model load reductions with STEPL
- ✓ QAPP
- ✓ Quarterly, Annual, and Final Reports

COOPERATING AGENCIES

Natural Resources Conservation Service
Soil and Water Conservation Districts
University of Missouri Extension
Missouri Department of Conservation
Branson Chamber of Commerce
Table Rock Lake Area Chamber of Commerce
Stone County Commission
James River Basin Partnership
Branson Public Works
Ozarks Water Watch
U.S. Army Corps of Engineers
Kimberling City

CONTACT

Project Manager: Gopala Borchelt
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Kimberling City, MO 65686
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Ph: (417) 739-4100
Fax:(417) 739-9889

MDNR Project Manager: Amanda Sappington/ Valerie Hentges
Subgrant #: G11-NPS-02
Project Period: July 15, 2011 – May 31, 2015

FY08-09 319 Grant: (Base)	$550,600
Match:	$368,000
Total funding:	$918,600

G11-NPS-04

South Grand Great Streets Initiative

Green Infrastructure Retrofits for an Urban Environment

East-West Gateway Council of Governments (EWG); HUC #: 071401010506

PROJECT DESCRIPTION

South Grand Boulivard is a major urban roadway (24,000+ vehicles per day) located in the urban environment of the city of St. Louis, Missouri. In partnership with the EWG, the city of St. Louis and the Metropolitan St. Louis Sewer District (MSD), including the South Grand Community Improvement District (CID) will highlight green infrastructure that is effective in urban and suburban areas, and to evaluate specifically its effectiveness to improve water quality of stormwater runoff. Preliminary water quality analysis of the pre-rain garden has been conducted by MSD in 2012.

This year (2012) the project initiated the rain garden implementation process along South Grand Boulevard. Rain gardens will consist of a variety of rain catchment methods for streets; each rain garden will be designed based on the size and conditions of each site. With a target implementation goal for rain garden installation for Spring 2013, there are several distinct target audiences including the public works and streets department staff of the city of St. Louis, the engineering and planning staff of MSD, as well as transportation engineers in the St. Louis region and state of Missouri, and local government officials in the St. Louis region.

OBJECTIVES

The project will demonstrate green infrastructure, specifically rain gardens, in an urban context, and will seek to remove pollutants from urban runoff that flows to the River des Peres and Mississippi River in order to improve local water quality and reduce gulf hypoxia. Specific objectives of this project include:

1. Reduce pollution entering the River des Peres and Mississippi River from urban runoff;
2. Demonstrate potential of green infrastructure to improve water quality in urban areas;
3. Increase citizen awareness of water quality issues and their role in reducing urban runoff; and
4. Educate government staff and leaders, public works directors and other technical experts about methods to reduce urban runoff and improve water quality.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan
- ✓ 150 days of pre-implementation monitoring
- ✓ Rain gardens implementation and brochure
- ✓ 150 days of post-implementation monitoring
- ✓ Analysis of trends, and data overview supplied annually to DNR
- ✓ Two BioBlitz
- ✓ 1 neighborhood pervious surfaces brochure
- ✓ 4 conference presentations
- ✓ 12 neighborhood association presentations
- ✓ Quarterly, Annual and Final Reports

COOPERATING AGENCIES

Metropolitan St. Louis Sewer District
Missouri Department of Conservation
Southern Illinois University – Edwardsville (SIUE)
South Grand Community Improvement District
City of St. Louis Board of Public Service
Academy of Science St. Louis

CONTACT

Project Manager: David Wilson
East-West Gateway Council of Governments
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MDNR Project Manager: Valerie Hentges
Subgrant #: G11-NPS-04
Project Period: January 1, 2011 – December 31, 2014

FY08-09 319 Grant: (Base)	$429,005
Match:	$286,005
Total funding:	$715,010

G11-NPS-05

Improving Nonpoint Source Pollution Education Through Project WET

Missouri State University; Statewide

Project WET (Water Education for Teachers) is a statewide program which will improve upon and ensure a consistent and well-established method of instruction in water-related education targeting nonpoint source pollution.

PROJECT DESCRIPTION

Project WET is a water quality education curriculum. A total of fifteen Project WET workshops will be offered to match the water quality concerns of each focus impaired watershed. Additionally, one Facilitator training will be offered each year to increase the number of facilitators across the state. Facilitators are trained to lead Project WET workshops and train new educators. This will increase the number of educators and keep the water education of our citizens increasing over time. In addition, one advanced in-state facilitator training and one 4-state advanced training per year with other facilitators from Arkansas, Oklahoma, Kansas and Missouri will be offered to experienced facilitators to increase their background knowledge.

OBJECTIVES

1. To train non-formal educators (Soil & Water Conservation Districts, State Parks, Missouri Department of Conservation, MDNR, etc.) and classroom teachers to use Project WET activities in their programs and classrooms to raise awareness of nonpoint source pollution issues in Missouri (15 statewide workshops);
2. To strengthen the Project WET Facilitator network by providing facilitator training opportunities, advanced training opportunities, and incentives for conducting workshops. Project WET facilitators are volunteers and providing these items helps energize the Facilitator network and in turn, they schedule more workshops than the fifteen listed above; and
3. To increase nonpoint source pollution education of students and non-formal audiences through better training of educators. If teachers are more comfortable with the information and with education materials they are more likely to use the materials with their students.

METHODS EMPLOYED

- ✓ Workshops to train teachers
- ✓ Workshops to provide training to Facilitators
- ✓ Workshops to provide advanced training to Facilitators
- ✓ Quarterly, Annual and Final Reports
- ✓ Pre-/Post-surveys of workshop attendees
- ✓ Presentations

COOPERATING AGENCIES

Missouri State University - Springfield
National Project WET
Missouri Department of Conservation Education
Consultants
University of Missouri – Extension Service
MO Stream Team Watershed Coalition
Missouri Department of Natural Resources
Watershed Committee of the Ozarks

CONTACT

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Aquatic Education Specialist
State Project WET Coordinator
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MDNR Project Manager: Valerie Hentges
Subgrant #: G11-NPS-05
Project Period: April 1, 2011 – December 31, 2014
FY08-09 319 Grant: $103,759
Match: $69,176
Total funding: $172,935

G11-NPS-08

Belews Creek Watershed Management Plan Implementation
Jefferson County Stormwater Management; HUC #07140104080007

PROJECT DESCRIPTION

The Belews Creek watershed (HUC #07140104080007) covers 26 square miles (16,500 acres) in central Jefferson County, is a stream order five tributary to the Big River, which is on the 303(d) list for lead impairment. The Belews Creek Watershed Management Plan Implementation project intends to improve the water quality in the watershed through the implementation of tasks identified in the accepted watershed management plan.

OBJECTIVES

1. To increase public awareness of the Belews Creek Watershed and improve public participation in maintaining the watershed;
2. To educate residents on waste management system issues and offer a cost-share pumpout program;
3. To increase riparian corridor along Belews Creek, leading to improved water quality and wildlife habitat;
4. To reduce sedimentation in Belews Creek with streambank stabilization projects, and to eliminate cattle from the creek;
5. To educate residents about sinkholes and offer cost-share for best management practices to protect them; and
6. To create a bio-retention and storm water management demonstration area behind the Jefferson County Administration Building, eliminating an erosion issue and developing a rain garden and outdoor education area.

METHODS EMPLOYED

- ✓ Workshops on low impact development, on-site waste management systems, karst/sinkhole issues/riparian corridor improvements, streambank stabilization
- ✓ Manuals for on-site waste management systems
- ✓ Electronic photo journal submitted to DNR
- ✓ Public Meetings, PSAs, press releases, newsletter articles, website updates
- ✓ Presentations (4)
- ✓ Quarterly, Annual and Final Reports

COOPERATING AGENCIES

Jefferson County Highway Department
Department of Conservation
Missouri Stream Team
Local Community Organizations

CONTACT

Project Manager: Ms. Kristi Bales,
Jefferson County Stormwater Management
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Mr. Mark Wiley, Belews Creek Watershed Partnership
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Hillsboro, MO 63050
E-mail: mwwiley@zakcompanies.com
Ph: (314) 220-3425

MDNR Project Manager: Jane Davis/Valerie Hentges
Subgrant #: G11-NPS-08
Project Period: April 1, 2011 – March 31, 2015

FY08-09 (Base) 319 Grant:	$180,200
Match:	$120,133
Total funding:	$300,333

G11-NPS-11

Nonpoint Source Pollution Prevention through Native Plantings in Stormwater Control

Jefferson City Samaritan Center; HUC #: 103001021305

PROJECT DESCRIPTION

The overall goal of this demonstration project is to educate the public on how to decrease the impacts of nonpoint source pollution in an urban setting. To achieve this goal, two rain gardens will be implemented. One rain garden will be near the driveway entrance of the Samaritan Center building to catch sediment and remediate the stormwater flow issues due to the addition of gravel to the overflow parking lot. The second rain garden will be in the field adjacent to the building which is used as a sports practice field for East Elementary School. Additionally, nine rain barrels will be installed at the building downspouts. A secondary goal of the project will be nonpoint source pollution education for the community. A rain barrel workshop will be hosted on-site, as well as, ways to maintain a healthy and environmentally friendly yard. An informational kiosk will be installed for independent learning of the best management practices on the property.

OBJECTIVES

1. To protect and improve water quality in the watershed by implementing two rain gardens & nine rain barrels on-site.
2. Provide Jefferson City residents an example of a low impact type of nonpoint source pollution best management practice using native plants in stormwater control located in a commercial setting.
3. Alleviate the storm water runoff problems experienced by the Samaritan Center.
4. Increase the amount of space available to students at East Elementary School for sports practices by eliminating the permanent wet spot in the practice field.
5. Increase educational awareness of nonpoint source pollution and effective ways for storm water control.

METHODS EMPLOYED

- ✓ 2 rain gardens, minimum 25' x 35', with native plantings and hardwood mulch
- ✓ 9 rain barrels, minimum, attached to building downspouts
- ✓ 1 permanent information kiosk
- ✓ 2 workshop handouts x approx. 100 copies each
- ✓ 12 site tours, minimum - local schools, youth organizations (scouts, 4-H, etc.) will be invited
- ✓ 1 webpage, with project description, information links and survey tool
- ✓ 7 media releases regarding installation
- ✓ 1 ribbon cutting ceremony
- ✓ 1 open house - Samaritan Center clients and volunteers invited to tour site
- ✓ 1 workshop - making rain barrels, maintaining healthy yards
- ✓ Quarterly, Annual and Final Report(s)

COOPERATING AGENCIES

Lincoln University
Jefferson City Eastside Business Association
Cole County Extension
Master Gardeners and other volunteers

CONTACT

Project Manager: Ben DeFeo
Samaritan Center
1310 East McCarty Street
Jefferson City, MO 65101
(573) 634-7776
Email address: bdefeo@midmosamaritan.org

MDNR Project Manager: Valerie Hentges
Subgrant #: G11-NPS-11
Project Period: May 1, 2011 – April 30, 2013
FY08-09 319 Grant: $6,000
Match: $4,000
Total federal funding: $10,000

G11-NPS-12

Hinkson Creek Urban Retrofit Project
Boone County Public Works; HUC #: 103001020602; 103001020706

PROJECT DESCRIPTION

Hinkson Creek is a dynamic stream system, with a drainage area of 90 sq. miles and has been on the 303(d) list since 1998 for unknown toxicity. In October 2009, the Department of Natural Resources drafted a total maximum daily load (TMDL) that identified the source of the impairment as urban runoff. The goal of the project is to reduce flooding, improve water quality and health of the aquatic life of Hinkson Creek by implementing monitoring and retrofit activities identified in the Hinkson Creek Watershed Management Plan. A 10-acre city-owned site that currently does not treat storm water runoff will be retrofitted with storm water best management practices (BMPs) to help reduce nonpoint source (NPS)pollution. A large subdivision (+200 homes) was built in the 1980s without storm water controls. To reduce peak flows and flooding, this residential subdivision will be retrofitted with rain gardens/rain barrels, tree plantings, flow-dissipation devices and community storm water treatment BMPs.

OBJECTIVES

1. Implement activities to help achieve the goals of the Hinkson Creek TMDL, the Watershed Management Plan, and protection of other streams in Columbia from NPS.
2. Retrofit two areas with storm water BMPs to help reduce NPS pollution and hydrologic load to the receiving streams.
3. Monitor the performance of selected BMPs.
4. Provide BMP performance data to private and governmental entities, so they can make informed decisions based on local conditions.

METHODS EMPLOYED

- ✓ Update Watershed Management Plan
- ✓ Newsletters, educational signs, news releases
- ✓ Community storm water BMPs
- ✓ Commercial site retrofit BMPs
- ✓ Step-pool Conveyance System; Rain Gardens and/or Rain Barrels; Tree Plantings
- ✓ Meetings, workshops, and trainings
- ✓ Maintenance Agreements (as needed)
- ✓ Design Specifications and performance data for rain garden BMPs
- ✓ Monitoring, precipitation, and flow data reports
- ✓ Quality Assurance Project Plan
- ✓ Quarterly, Annual, and Final Report(s)

COOPERATING AGENCIES

City of Columbia
Missouri River Community Network
Missouri Society of Professional Engineers
JobPoint
Missouri Academy of Professional Soil Scientists
Sierra Club Water Sentinel
University of Missouri
Columbia Volunteer Services
Columbia Parks and Recreation Department
Missouri Department of Conservation
Natural Resources Conservation Service

CONTACT

Project Manager: Georganne Bowman
Boone County Public Works
801 E. Walnut, Room 315
Columbia, MO 65201
(573) 886-4330
Email address: gbowman@boonecountymo.org

Project Manager: Amanda Sappington/Valerie Hentges
Subgrant #: G11-NPS-12
Project Period: March 1, 2011 – April 30, 2014
FY08-09 319 (Incremental) Grant: $713,266
Match: $523,000
Total funding: $1,236,266

G11-NPS-13

Operation Brightside Demonstration Garden and Learning Center
Operation Brightside, St. Louis, MO; HUC #: 071401010506

PROJECT DESCRIPTION

Operation Brightside is a not-for-profit organization in St. Louis with a mission of restoring, maintaining, and growing the community landscape by leading cleaning and greening initiatives. This site will allow for the community to compare the implemented low impact development (LID) and best management practices (BMPs) for greater adaption.

OBJECTIVES

1. Redevelop a vacant lot into a demonstration garden and learning center site incorporating several LID and BMPs.
   - LID practices for inside and beside the demo garden: porous concrete, pervious asphalt and permeable pavers.
   - LID practices in front of Operation Brightside Headquarters: silva cells with trees and permeable pavers.
   - BMPs for the demo garden: bio-retention cell and rain garden, bio-swale, native plantings, rain barrels, and cistern.
2. Provide at least eight educational workshops to community residents, students, neighborhood leaders, and government officials.
3. Offer four CEC classes for urban planners, architects, engineers, and developers to increase knowledge of LID/BMPs for an urban landscape.
4. Create independent learning opportunities with interpretive signage and a brochure.
5. Construct a literature kiosk in the demonstration garden and learning center to display publications provided by partners to educate visitors about LIDs and BMPs. Visitors will be able to take publications with them to implement LID practices at home or in their neighborhood.
6. Work with other agencies and organizations in the area (e.g., East-West Gateway and Tower Grove Heights) to promote LIDs and BMPs.
7. Inform community of project progress and awareness though news releases, website updates, online photo updates, and additional media forms as appropriate.

METHODS EMPLOYED

- ✓ Eight LIDs and BMPs in the demonstration garden and learning center
- ✓ Eight educational workshops for community residents/students, neighborhood leaders, and government officials
- ✓ Four continuing education credit classes for urban planners, architects, engineers, etc.
- ✓ Updated webpage on project progress
- ✓ Interpretive signage and informational kiosk
- ✓ Quarterly, Annual, and Final Report(s)

COOPERATING AGENCIES

Missouri Department of Conservation
Metropolitan St. Louis Sewer District
Alberici Constructors
St. Louis Master Gardeners
City of St. Louis
Missouri Botanical Garden
SWT Design

CONTACT

Project Manager: Mary Lou Green
Operation Brightside
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St. Louis, Missouri 63110
(314) 772-4646
marylou.brightside@gmail.com

MDNR Project Manager: Valerie Hentges
Subgrant #: G11-NPS-13
Project Period: April 1, 2011 - March 31, 2014

FY08-09 319 Grant:	$105,400
FY04 319 Grant:	$113,000
Match:	$145,600
Total funding:	$364,000

G11-NPS-14

Wildcat Glades Education Project

Wildcat Glades Conservation and Audubon Center; HUC #: 11070207

PROJECT DESCRIPTION

Spring River Watershed (11070207) encompasses 1,657,518 acres in southwest Missouri. Water education is an increasingly important issue in southwest Missouri as the area struggles with water quality issues, i.e., bacteria levels and water availability pressures in the region. Various other activities, i.e., water quality monitoring and educational materials, will also occur to support the main objective of the project.

OBJECTIVES

Education of students can help lead the way to a reduction in nonpoint source (NPS) pollution impairments. The Joplin R-8 School District supports Wildcat Glades' educational programs. The project focus will be low-income, or Title 1, schools in this district, which is determined by the amount of students on free or cost-reduced lunches. Wildcat Glades created a new two-part NPS-focused educational program with an incorporation of existing water quality related activities, e.g., Stream Team water quality monitoring. The new NPS-focused program will focus on creating a storm drain stenciling program in Joplin and the surrounding communities. All educational programs contain the state's grade level expectations (GLEs) and fit into the school's curriculum. Specific objectives of this project include:

1. To provide local low-income/Title 1 schools NPS-focused educational programs through 2013/14 school years.
2. Conduct at least six Stream Team sampling events per year.
3. Compile and distribute one of the Wildcat Glades' quarterly newsletters with a NPS focus annually.
4. Reach at least 100 underserved individuals through a new two-part NPS-focused educational program and water quality monitoring.
5. Develop watershed map and brochure.

METHODS EMPLOYED

- Watershed map and brochure
- News releases
- Updated web page on water quality
- New (two-part) NPS-focused educational program
- Newsletter with water quality emphasis (annual)
- Interpretive signage
- Stream Team Volunteer Water Quality Monitoring data
- Quarterly, Annual, and Final Report(s)

COOPERATING AGENCIES

Joplin R-8 School District

CONTACT

Project Manager: Robin McAlester
Wildcat Glades Conservation and Audubon Center
201 W. Riviera Drive, Suite A
Joplin, MO 64801-5638
(417) 782-6287
Email address: rmcalester@audubon.org

Project Manager: Valerie Hentges
Subgrant #: G11-NPS-14
Project Period: March 15, 2011 - May 31, 2014
FY08-09 319 Grant: $128,401
Match: $85,668
Total funding: $214,069

G11-NPS-16

Quick Creek Park Environmental Education Project
City of Doniphan; HUC #: 110100080902

PROJECT DESCRIPTION

The purpose of the Quick Creek Park Environmental Education Project will be to implement conservation practices through restoration and educational efforts at this particular site. The purpose of such an initiative will not only be restoration-oriented, but it will focus upon educational events that in return will facilitate more restoration activities to reduce nonpoint source (NPS) pollution.

OBJECTIVES

The restoration activities include:

1) Restoring native vegetation to this site
2) Implementation of rain gardens to demonstrate the effectiveness and ease of managing storm water runoff
3) Writing a lawn nutrient management plan for the athletic fields

The educational activities include:

1) Involving school groups such as the Future Farmers of America (FFA), Science Club and other classes in implementing and managing these restoration sites
2) Constructing outdoor learning classrooms
3) Implementing educational activities for community events such as Earth Day and/or Arbor Day

METHODS EMPLOYED

- Revegetate approximately 5 acres of disturbed area.
- Plant two demo plots of native grasses and wildflowers.
- Design and construct at least two rain gardens in and around the Quick Creek Park complex.
- Erect educational signs at public rain gardens.
- Write turf nutrient management plans for specified fields.
- Create and distribute educational brochures detailing the issues of nonpoint source pollution.
- Form a Missouri Stream Team for Quick Creek sponsored by a Doniphan School organization.
- Reduce nutrient (phosphorus, nitrogen), bacteria, heavy metals and volatile organic compound inputs into local waterways.

PRODUCTS

- Lawn nutrient management plan for athletic fields
- Rain Garden
- Outdoor classrooms
- Presentations for local civic groups and other citizens
- Signage for site
- Photo journal and press releases
- Pre-/post-surveys
- Memorandum of Understanding (MOU) between Doniphan and school for on-going maintenance of outdoor classrooms

COOPERATING AGENCIES

Natural Resources Conservation Service
Missouri Department of Natural Resources
University of Missouri-Extension
Ozark Foothills RPC

CONTACT

The City of Doniphan
Connie Teslow, City of Doniphan Clerk
124 West Jefferson St.
Doniphan, MO 63935
donclerk@windstream.net
(573) 996-2623

MDNR Project Manager: Jane Davis/Valerie Hentges
Minigrant #: G11-NPS-16
Project Period: May 1, 2011 – April 30, 2013

FY08-09 319 Grant:	$10,000
Match:	$6,670
Total funding:	$16,670

G11-NPS-22

Stormdrain Marker Program
City of Rolla – Public Works; HUC #: 071401020108

PROJECT DESCRIPTION

Data indicates several of the streams within Rolla city limits, including Dutro Carter Creek and Burgher Branch, are on the 303(d) list of impaired waterways due to low dissolved oxygen making it apparent that nonpoint source (NPS) pollution has become enough of an issue of concern. This project will be conducted by purchasing and installing 2,000 stainless steel markers on storm sewer structures located in high visibility areas of town. The markers will alert residents that anything dumped into storm drains will impact streams and water quality. The work will be done by a Phelps County Venture Crew #84, local Boy Scout and Girl Scout troops and middle school children and will include training of the participants in fundamentals of non-point source pollution and its prevention. This will be the initial stage of a phased project that will eventually include markers on approximately 4,200 storm structures in Rolla.

OBJECTIVES

Project activities are intended to make the public more aware of the role that storm sewer inlets play in the quality of nonpoint source pollution prevention.

1) Volunteer training for installation of storm drain markers.
2) Installation of 2,000 stainless steel markers on storm sewer structures.
3) Conducting a public information campaign including printed materials and media coverage.

METHODS EMPLOYED

- Install 2,000 stainless steel storm drain markers on storm water collection structures in high visibility areas.
- Outreach through local media outlets and printed materials to raise NPS awareness
- Training of Venture Scouts to properly install the markers and teaching them the fundamentals of NPS pollution and its prevention.

PRODUCTS

- 2,000 "No Dumping, Drains to Stream" markers installed on storm drain structures
- Photo log of the project
- Pre and post installation survey results
- Media and printed materials emphasizing water quality

COOPERATING AGENCIES

Phelps County Venture Crew #84
Local Girl and Boy Scouts

CONTACT

Project Manager: Anne McClay
City of Rolla Public Works
P.O. Box 979
901 N. Elm Street
Rolla, MO 65402
amcclay@rollacity.org
(573) 426-6955

MDNR Project Manager: Valerie Hentges
Minigrant #: G11-NPS-22
Project Period: September 10, 2011 – September 9, 2013

FY08-09 319 Grant:	$10,000
Match:	$6,667
Total funding:	$16,667

G11-NPS-23

Mid-Missouri Water Safety Project (Pharmaceuticals & PCPs)
Columbia Housing Authority Low-Income Services; HUC #: 103001020601; 2; 3

PROJECT DESCRIPTION

An alarming trend among recent water quality studies is the presence of pharmaceuticals and personal care products found in local water bodies. The purpose of the Mid-Missouri Water Safety Project will be to protect local water bodies by properly disposing of pharmaceuticals and personal care products (pcp's).

OBJECTIVES

This project will seek to raise awareness and increase the capacity of Mid-Missouri counties to protect local bodies of water by properly disposing of pharmaceuticals and personal care products.

1) Increase awareness about environmental and community risks associated with the improper disposal of pharmaceuticals and personal care products.
2) Increase awareness about best practices regarding the disposal of pharmaceuticals and personal care products.
3) Increase collaboration among state and local agencies regarding the disposal of pharmaceuticals and personal care products.

METHODS EMPLOYED

- Increase of the number of educational materials distributed
- Increased participation at take back events
- Pre/Post surveys at the conference
- Participation of new collection sites in a take back event
- Number of new agencies participating/partnership agreements
- Number of "commitment makers" forms collected

PRODUCTS

- Distribution of 3,500 units of educational materials
- 80,000 pills, liquids, or pcp's collected at the take-back days.
- 6 new collection sites identified in the Mid-Missouri area during the project period.
- 20 new partnerships established.
- 10 new agencies participating in providing pharmaceutical and personal care product disposal events.
- 20 agencies signing on as "commitment makers" to continue education regarding pharmaceuticals and PCPs

COOPERATING AGENCIES

Big Brothers Big Sisters
Boys and Girls Club
Univ. of Missouri Wellness Resource Center
Columbia/Boone County Health Department
Columbia Parks and Recreation Department
Police Departments of Ashland, Hallsville, Centralia, Sturgeon, and University of Missouri
Mediacom
D&H Drug Store
Boone County Sheriff's Department

CONTACT

Project Manager: Ryan Worley
Columbia Housing Authority – Low Income Services
201 Switzler Street
Columbia, MO 65201
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(573) 443-2556

MDNR Project Manager: Valerie Hentges
Minigrant #: G11-NPS-23
Project Period: December 1, 2011 – November 30, 2013

FY08-09 319 Grant:	$8,000
Match:	$6,766
Total funding:	$14,766

G12-NPS-01

MU Hinkson Creek Watershed Assessment of BMPs for Water Quality Improvements & Effectiveness
University of Missouri – Columbia; HUC #: 103001020602 and 603

PROJECT DESCRIPTION

This University of Missouri (MU) led project focuses on the Middle Hinkson Creek and Lower Hinkson Creek hydrologic unit code (HUC) 12 watersheds (HUCs 103001020602 and 603) where MU's campus and the majority of the city of Columbia, Missouri, are located. The project will monitor the performance of a series of best management practices (BMPs) with respect to volume reduction and associated water quality improvements. The BMPs implemented, demonstrated, and evaluated include: bioretention basins for mitigation of nutrients, sediment, *E. coli*, and to reduce first flush volume of stormwater; bio- and grassy swales, e.g., rain gardens, for mitigation of nutrients and sediment and reduction of storm water flow, including the first flush; detention basin with innovate discharge control structure for reducing the velocity of stormwater flow; and a willow reforestation in a riparian corridor of Hinkson Creek to determining the effects of deep rooted, hydrophilic trees on lowland stormwater volume reduction. Reduction of storm water velocity and reduced first flush volume of storm water is the primary focus of the efforts to address the TMDL. Presentations for the planting and maintenance BMP activities will provide education to a project initiated volunteer group, then in-turn be service learning opportunities for these and other student organizations interested.

OBJECTIVES

1) Evaluation of the effectiveness of various vegetated BMPs at reducing runoff volumes; BMPs will be instrumented in locations where demonstrations, field days and training can occur with local partners.
2) Placement of a series of BMPs to quantify the compound effects of several practices on achieving improvements to the overall performance of the pollution control system.
3) Initiate educational programs and demonstration field days of a series of vegetated BMPs designed for increased volume reduction.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan (QAPP)
- ✓ BMP Workshop/Conference (1 total)
- ✓ BMP educational/interpretative signs
- ✓ Performance summaries/factsheets (at least one for each project site total)
- ✓ Field Day Reports (in conjunction with project partners)
- ✓ Quarterly submittals of the raw water quality data
- ✓ Analysis of trends and data overview supplied annually to DNR (including load reductions)
- ✓ Data submission/acceptance to MoWIN and International BMP Database
- ✓ Quarterly, Annual, and Final Report(s)

COOPERATING AGENCIES

Boone County
University of Missouri Extension – Water Quality
City of Columbia

CONTACT

Project Manager: Dr. Enos C. Inniss
University of Missouri – Columbia
Civil & Environmental Engineering
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(573) 882-2041
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MDNR Project Manager: Valerie Hentges
Subgrant #: G12-NPS-01
Project Period: April 1, 2012 – March 31, 2014
FY10 319 Grant: (I) $253,800
Match: $169,267
Total funding: $423,067

G06-NPS-26

Mercury Deposition Network

National Atmospheric Deposition Program

PROJECT DESCRIPTION

The Mercury Deposition Network (MDN) is a network of states and Canadian Provinces that sponsor over 50 precipitation collection sites scattered across North America. The objective of the MDN is to develop a national database of weekly concentrations of total mercury in precipitation and the seasonal and annual flux of total mercury in wet deposition. The MDN supplies the States with scientifically sound, consistent and comparable national data. MDN uses an accepted method for direct measurement of total mercury wet deposition that is suitable for routine collection. MDN supplies spare parts and technical support to each location and routinely audit all MDN sites to assure compliance with quality assurance/quality control procedures. The Environmental Services Program (ESP) also provides technical support in the setup and maintenance of Missouri's MDN station. The Air Pollution Control Program (APCP) aids the WPP in analysis of the data as well as tracking the sources of atmospheric mercury. The APCP will also play a critical role in implementing the Total Maximum Daily Load (TMDL) within Missouri.

The MDN uses the data to develop information on spatial and seasonal trends in mercury deposited to surface waters. The Missouri Department of Natural Resources will use the data and models in developing a TMDL and in policy discussions regarding control of mercury emissions.

OBJECTIVES

1) The department will continue operation of the Mingo National Wildlife Refuge mercury deposition collection station.
2) The department will enhance the mercury deposition network data for Missouri by adding a mercury deposition collection station at the University of Missouri – Columbia's (UMC) Baskett Research & Education Area (BREA) near Ashland.

METHODS EMPLOYED

- ✓ MOA with University of Illinois
- ✓ Contract with UMC
- ✓ Quarterly invoicing
- ✓ Quality Assurance Project Plan
- ✓ Data posted and retrieved via MDN Internet site

COOPERATING AGENCIES

University of Missouri – Columbia
National Atmospheric Deposition Program
University of Illinois – Illinois State Water Survey

CONTACT

Project Manager: David Gay
University of Illinois – Illinois State Water Survey
2204 Griffith Dr.
Champaign, IL 61820-7495

MDNR Project Manager: Amanda Sappington/Valerie Hentges
Subgrant #: G06-NPS-26
Project Period: July 1, 2010 – June 30, 2013
FY06 319 Grant: $66,432
Total funding: $66,432

G08-NPS-09

Hinkson Creek Watershed Restoration Project, Phase II
Boone County Commission; HUC #: 103001020603; 2; 1

PROJECT DESCRIPTION

Hinkson Creek runs through the city of Columbia in Boone County Missouri. Current urban develop along the I-70/63 corridor has increased both the intensity and frequency of large storm flow events. During the second phase of the Hinkson Creek Watershed Restoration, efforts will be focused towards reducing peak storm flow by providing incentives for a variety of best management practices (BMPs) for new and existing developments. A project steering committee will provide technical assistance and the stakeholder committee will help prioritize milestones and direct implementation efforts developed in the watershed management plan. A unit pricing feasibility study will be conducted to provide cost-estimates for BMPs in the target area. It is anticipated that at least four (4) stormwater retrofits/BMPs will be completed in this project. Efficiency data for each BMP was planned to be collected to determine load reductions. Landscaping Workshops and clean-up events will help keep residents involved in watershed protection. Additionally, low impact development (LID) workshops will be held for construction and development contractors. Due to the economic conditions and time constraints, BMP implementation landowners were not able to commit to the BMPs implementation matching contributions.

OBJECTIVES

1. To reduce stormwater peak flows and watershed degradation from urbanization by providing technical and financial assistance to developers, builders and property owners.
2. To encourage adoption of bmps, and encourage stormwater retrofits on previously developed areas through cost-share assistance and training seminars.
3. To provide information to developers on the effectiveness of bmps in reducing stormwater peak flows, accomplished via pre and post construction monitoring, and reporting.
4. Conduct education and outreach activities which will engage stakeholders, developers, and landowners in the Hinkson Creek Watershed.

METHODS EMPLOYED

1. Steering and stakeholder committee
2. Web site
3. Update Hinkson watershed management plan
4. BMP feasibility study
5. Develop a monitoring plan/QAPP
6. Leveraging of current monitoring efforts from partners
7. Stormwater Forum/Stormwater PSA
8. Landscape workshops (2 per year)
9. LID workshops (2 total)
10. Clean-up events (1 per year)
11. Stream bank stabilization projects
12. Develop a photo journal and update the website
13. Monitor BMP effectiveness, load reductions in the Hinkson Creek Watershed
14. Quarterly, Annual, and Final Reports

COOPERATING AGENCIES

City of Columbia
Boone County Soil and Water Conservation District
University of Missouri – Department of Forestry, and Environmental Health and Safety
Columbia Development Council
Master Naturalists
Missouri Stream Teams
Sierra Club
Columbia Access TV

CONTACT

Project Manager: Bill Florea
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(573) 886-4330

MDNR Project Manager: Tucker Fredrickson/ Valerie Hentges
Subgrant # G08-NPS-09
Project period: June 1, 2008 – October 31, 2011

FY06 319 Grant:	$300,884
FY03 319	$100,720
Match:	$267,736
Total funding:	$669,340

G08-NPS-13

On-Site System Identification & Remediation Project
Table Rock Lake Water Quality, Inc.; HUC #: 11010002 050 and 070

PROJECT DESCRIPTION

The goal of the project is to implement on-site system remediation to address the nutrient impairment within the watersheds of two (2) eleven-digit hydrologic unit code (HUC11); 11010002 050 and 070. The project will target the failing systems of homeowners' whose properties are adjacent to James River and Table Rock Lake. The project implemented the repair or replacement of 27 on-site systems (with an original goal of 22), clean out over 100 septic tanks, on-site system maintenance agreements signed by homeowner participants, outreach activities (e.g., quarterly newsletters, informational articles, workshops, field days, educational materials/brochures, maps, Web site, and video), training of Stone County Health Department staff on how to use TWIST (a management tool for on-site system tracking), linking TWIST to known and new GIS data, and water quality monitoring, optical brightener detection, and dye tracing.

OBJECTIVES

Actions that implemented as part of the watershed management plan:

- ✓ Customize and implement a computer-based on-site management system utilizing The Wastewater Information System Tool (TWIST) for compilation of data on existing, upgraded and new systems in Stone County;
- ✓ Provide database of system locations, management software, and training to Stone County Health Department;
- ✓ Identify at least 22 failing on-site systems;
- ✓ Pump out an additional 100 on-site systems;
- ✓ Educate targeted watershed residents and general public;
- ✓ Develop a Quality Assurance Project Plan (QAPP) prior to any water quality monitoring and GIS development;
- ✓ Monitoring the direct water quality impact to the Lower James River and Table Rock Lake due to failing on-site systems using optical brightener detection, *E. coli* bacteria monitoring, and dye tracing; and
- ✓ Improve water quality in response to remediation efforts through nutrient load.

METHODS EMPLOYED

- ➢ Steering Committee meetings; MOU
- ➢ On-site system maintenance agreement
- ➢ Educational materials and outreach
- ➢ 27 on-site system repairs and replacements
- ➢ Over 100 on-site system pump-outs
- ➢ TWIST database
- ➢ Training for Stone County Health Department
- ➢ QAPP
- ➢ GIS/mapping
- ➢ Water quality monitoring and dye tracing

COOPERATING AGENCIES

Stone County Mapping/GIS Department
Stone County Health Department
Stone County Commission
Upper White River Basin Foundation (UWRBF)
Stone County Gazette
Stone County Calendar
Missouri State University
Ozarks Environmental Water Resources Institute
James River Basin Partnership (JRBP)
Watershed Committee of the Ozarks (WCO)
U.S. Army Corps of Engineers
Missouri Department of Health and Senior Services
Table Rock Lake Chamber of Commerce

CONTACT

Project Manager: Gopala Borchelt
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Kimberling City, MO 65686
(417) 739-4100
Gopala@trlwq.org

MDNR Project Manager: Stacia Bax/Amanda Sappington/Valerie Hentges
Subgrant #: G08-NPS-13
Project Period: July 15, 2008 – October 14, 2011

FY06 319 Grant:	$300,000
Match:	$200,000
Total funding:	$500,000

G09-NPS-02

Locust Creek Restoration Project

Missouri Department of Natural Resources – Division of State Parks; HUC #: 102801030902; 3; 4

PROJECT DESCRIPTION

Historically, channelization and excessive levee construction were widely implemented by many landowners throughout the Locust Creek Watershed. These practices contribute to rapid erosion, causing the channel to fill with sand and silt, effectively eliminating pool habitat and coarse substrate. Locust Creek has been channelized for over half its length and lacks a suitable riparian corridor in many places. Initially, rock grade-control structures were implemented in a large headcut leading from Locust Creek to Higgins. Phase II involves the installation of a large, site-specific rock diversion structure in Higgins Ditch. This will reduce erosion and sedimentation in the lower portions of Locust Creek, and restore the natural hydrology of the stream system. The Phase II structure will protect the Phase I grade control structures from being undermined by downstream headcutting. Future efforts will be directed at reducing erosion throughout the watershed to further reduce sedimentation at Pershing State Park. Other benefits of this project will include educational signs on the boardwalk of Pershing Sate Park, educational tours, and professional presentations.

OBJECTIVES

- ✓ Stop soil loss and sediment erosion
- ✓ Restore natural hydrology to the portion of Locust Creek south of U.S. Highway 36.
- ✓ Monitor changes to hydrology and water quality.
- ✓ Educate citizens and resource professionals about the impacts of channelization and opportunities for restoration.

METHODS EMPLOYED

- Design and install site-specific grade-control structure
- Logjam inventory and removal
- Survey and visual inspection of streams and structures
- Hydrology and water quality monitoring
- Public meetings
- Interpretive signs on Pershing State Park boardwalk
- Professional presentations
- Quarterly, Annual and Final Reports

COOPERATING AGENCIES

Missouri Department of Natural Resources
Missouri Department of Conservation
Missouri Department of Transportation
Missouri Conservation Heritage Foundation
Natural Resources Conservation Service
Massasauga Flats, LLC.

CONTACT

Project Manager: Mike Currier
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MDNR Project Manager: Amanda Sappington/ Valerie Hentges
Subgrant #: G09-NPS-02
Project Period: October 1, 2008 – December 31, 2012

FY02 319 Grant:	$91,305
FY05 319 Grant:	$130,750
FY06 319 Grant:	$108,695
Match:	$220,500
Total funding:	$551,250

G09-NPS-04

Mound Branch Watershed Evaluation & Restoration Project
Osage Valley Resource Conservation & Development Council; HUC # 10290102120005

PROJECT DESCRIPTION

Mound Branch encompasses 32,748 acres located entirely within east-central Bates County in Missouri. This project will increase average *dissolved oxygen (DO) levels*, reduce average *ammonia* levels, and reduce *sediment* loading within Mound Branch. Through the implementation of best management practices (BMPs) such as field borders, riparian buffers, filter strips, crop residue management, planned grazing systems, streambank erosion rehabilitation, riparian corridor management, integrated crop and nutrient management, lawn nutrient/pest management, and on-site wastewater system modifications, this project will seek to improve water quality within Mound Branch. Additional workshops and trainings will be offered for: windbreak/cattle shade structure design, stormwater runoff management, and the care/use of residential yard wastes. A Quality Assurance Project Plan (QAPP) will be developed for monitoring water quality at nine sites within Mound Branch and its tributaries. Not all of these objectives were achieved due to various complications during the project.

OBJECTIVES

1. To increase *DO* levels by 20% above the Butler Wastewater Treatment Plant (BWWTP) *and* below the BWWTP in the 303(d) listed segment of Mound Branch.
2. To decrease the *ammonia* levels by 20% above the BWWTP *and* below the BWWTP in the 303(d) listed segment of Mound Branch.
3. To decrease the sediment load entering Mound Branch by a total of 3,500 tons.
4. To encourage adoption of best management practices (BMPs) to reduce the amount of nutrients, soil, chemicals, fertilizers, and other pollutants entering Mound Branch.
5. To utilize watershed modeling results and water quality trend data to modify project activities during the course of the project.
6. To provide information through trainings to agricultural producers, and urban/rural landowners on the effectiveness of BMPs in reducing pollutants.
7. Conduct education and outreach activities which will engage stakeholders, agricultural producers, and all landowners in the Mound Branch Watershed.

METHODS EMPLOYED

1) Steering Committee & Technical Review Group; Awareness meetings
2) Educational brochures/Project fact sheet
3) In-stream Monitoring Plan/QAPP
4) BMP implementation
5) Photo journal
6) Monitor BMP effectiveness, load reductions
7) Educational Trainings

COOPERATING AGENCIES

Bates County Commissioners
Bates County Soil and Water Conservation District
Bates County Health Department
Citizens Watershed Committee
City of Butler
Henry County Health Department
Missouri Department of Conservation
Missouri Stream Teams
Natural Resources Conservation Service
Osage Valley Resource Conservation and Development Councils
University of Missouri Columbia – Extension
Vernon County Health Department

CONTACT

Project Manager: Mackenzie O'Neill
Osage Valley Resource Conservation & Development Council, Inc.
P.O. Bo 420
Butler, MO 64730

MDNR Project Manager: Tucker Fredrickson/ Valerie Hentges
Subgrant #: G09-NPS-04
Project period: July 1, 2009 – June 8, 2012
FY07 319 Grant: $1,157,003
Match: $771,335
Total funding: $1,928,338

G10-NPS-02

Demonstrating Integrated Water Management Systems for Improved Water Quality
University Of Missouri – Columbia; HUC #: 071100030303; 071100040103

PROJECT DESCRIPTION

Increased water infiltration in the soil and less surface water runoff are two of the water quality benefits of subsurface drainage. Runoff water carries sediment and attached nutrients to surface waters. The lowest nitrate-N concentrations have been found under shallow water table management using an Integrated Water Management System (IWMS; Kalita and Kanwar 1993). This is similar to the arrangement in the University's demonstration site. Intensive management of the water level in the soil using an IWMS is a practice of controlling drainage water flow and the soil water level using a subsurface drainage or subirrigation system. A control structure manages the release of drainage water and keeps the soil below the root zone wet for a longer period of time. An IWMS should increase harvest output (grain N removal) and immobilization by the plant, increase denitrification during the winter months, and reduce N levels in drainage outflow and N stored in soil layers that may be unavailable to the plant. Pesticides generally degrade at a faster rate than nitrate and are held tighter by the soil; therefore, they are less available for transport later in the year. Similarly, metribuzin (Sencor) degradation was faster in a soil with subirrigation (Jebellie and Prasher 1998). Simulation studies have shown that free drainage had the greatest aldicarb (Temik) losses while managed drainage resulted in the lowest amount of loss through drainage outflow (Munster et al. 1996).

OBJECTIVES

In years with low rainfall or other factors limiting crop growth, residual N from an application to corn many remain in the soil profile (Nelson et al. 2009) and be susceptible to loss (Blevins et al. 1996). This site will:

1) demonstrate the effect of subsurface drainage on surface water runoff, sediment, and phosphorus loss;
2) demonstrate the effects of managed drainage on reduced nitrate-N loss and initiate educational programs and demonstration field days of IWMS best management practices.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan (QAPP)
- ✓ Field Days (2 total)
- ✓ Drainage Workshop (1 total)
- ✓ Web-based summaries (2 total)
- ✓ Field Day Reports (3 each year)
- ✓ Drainage Management Design Manual (1 total)
- ✓ Quarterly submittals of the raw water quality data (to the Department)
- ✓ Analysis of trends and data overview supplied annually (to the Department)
- ✓ Quarterly, Annual, and Final Reports

COOPERATING AGENCIES

University of Missouri – Columbia
Natural Resources Conservation Service
Missouri Land Improvement Contractors Association

CONTACT

Project Manager: Dr. Kelly Nelson
Research Associate Professor
Division of Plant Sciences
University of Missouri
Greenley Research Center
P.O. Box 126
Novelty, MO 63460
(660) 739-4410

MDNR Project Manager: Valerie Hentges
Subgrant #: G10-NPS-02
Project Period: February 1, 2010 – January 15, 2012

FY03 319 Grant:	$126,000
FY05 319 Grant:	$159,933
Match:	$192,562
Total funding:	$478,495

G10-NPS-03

Statewide Lake Assessment Project
University of Missouri – Columbia; Statewide

PROJECT DESCRIPTION

This statewide assessment will include lake-watersheds that represent the continuum of size and land cover conditions within Missouri. The project continues to expand the historic data set on Missouri reservoirs by collecting water quality data from ~75 lakes across the state. Each Spring, selected lakes represent the full range of size, use, and geographical location in Missouri. Continued sampling of these primary lakes provides a "statewide baseline" of water quality data which allows for the identification of large scale regional trends. Assessment will occurs each summer, with each sampling circuit lasting three weeks (period required to collect one sample from each lake, about 25 per week). This schedule is repeated four times so that water quality during the summer season is documented. Parameters measured include total nitrogen, total phosphorus, algal chlorophyll, total suspended solids (measure of sediment), turbidity, conductivity, and dissolved organic carbon.

OBJECTIVES

1) Determine the current water quality of Missouri's lakes.
2) Quantify the factors regulating water quality in Missouri's lakes.
3) Monitor for long-term changes in water quality in individual lakes.

METHODS EMPLOYED

1) Update Quality Assurance Project Plan (QAPP)
2) Annual data set to be supplied to the Department (~75 lakes per year)
3) Invoices and Quarterly Reports (includes an annual list of lakes to be sampled)
4) Individual lake reports written and supplied to Lake Associations or managing agency (MDC) upon request (reviewed and approved by Department Project Manager)
5) Outreach efforts will include contributing to the Water Line Newsletter, Lake Association Data Reports and conducting presentations on lake ecology and water quality (Water Quality Short Course training, Columbia Aquatic Restoration Project, etc.). Planned outreach efforts will be submitted to the Department Project Manager prior to the event and approved.
6) Annual Report to Department
7) Interim FY Final Reports and Overall Final Report

Data is provided to the Department with the March Quarterly Report for use in the 305(b) report and 303(d) List. Data is also provided upon request to research scientists, MDC staff and lake associations.

COOPERATING AGENCIES

University of Missouri, Department of Fisheries and Wildlife Sciences
Missouri Department of Conservation
Missouri Department of Natural Resources
Environmental Protection Agency Region 7

CONTACT

Project Manager: Dr. Jack Jones and
Daniel V. Obrecht
University of Missouri Columbia
302 ABNR Building
Columbia, MO 65211
Phone: (573) 882-3543

MDNR Project Manager: Valerie Hentges
Subgrant #: G10-NPS-03
Project Period: September 1, 2010 – August 31, 2014

FY 04, 05, 06 08-09 319 Grants:	$349,424
Match	$232,949
Total funding:	$582,373

G10-NPS-04

Lakes of Missouri Volunteer Program

University of Missouri – Columbia; Statewide

PROJECT DESCRIPTION

The Lakes of Missouri Volunteer Program (LMVP) is an ongoing project that uses citizen monitors to collect water samples and water quality data from Missouri lakes. Volunteers are supplied with equipment and training needed to collect and process lake water samples. The sample season runs from April through September, with sample collection occurring every three weeks, for a total of eight samples each year. While on the lake, volunteers take surface temperature and Secchi transparency readings. The composite consists of three grab samples from the surface of the lake. LMVP staff analyzes the samples in the Limnology lab of the University of Missouri – Columbia. Once all of the lake samples are analyzed, the data are compiled and reported to the regulatory agencies. The data are also used to create an annual Data Report. During the spring of each year LMVP staff holds regional data review meetings. Data Reports for the previous season are distributed and the LMVP staff reviews the findings with the volunteers, agency personnel and public who attend the meetings.

OBJECTIVES

The ongoing objectives of the LMVP are to:

1) determine water quality of Missouri lakes;
2) monitor for long-term changes in water quality; and
3) educate the public about lake ecology and water quality issues.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan
- ✓ Annual Data Report
- ✓ Website maintained quarterly
- ✓ 2 newsletters per year
- ✓ Power point presentations to interested civic groups
- ✓ Regional data reviews
- ✓ Niangua Sampling Event (2010 – 2011)
- ✓ Watershed-wide snapshot sampling (TBD; 2012-2013)
- ✓ Recognition and incentives for volunteers contributing more than 5 years.
- ✓ Electronic copy of raw data submitted to MDNR
- ✓ Quarterly, Annual and Final Reports

COOPERATING AGENCIES

University of Missouri – Columbia
Missouri Department of Conservation

CONTACT

Project Manager: Dr. Jack Jones and Anthony Thorpe
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Columbia, Mo. 65211
(573) 882-3543

MDNR Project Manager: Valerie Hentges
Subgrant #: G10-NPS-04
Project Period: September 1, 2010 – August 31, 2013
FY04, FY05, FY06, FY08-09 319 Grant: $366,411
Match: $244,274

G10-NPS-05

Eastern Table Rock Lake Watershed Management Plan
Table Rock Lake Water Quality, Inc.; HUC #: 110100011307; 110100011401; 10100011402; 110100011403; 110100011404

PROJECT DESCRIPTION

The combined sub-watershed area surrounding Eastern Table Rock Lake (as defined in this project) is approximately 71,500 acres with the majority of Table Rock Lake contained within Stone and Taney counties in Missouri. The Watershed Management Plan (WMP) for the Eastern Table Rock Lake sub-watersheds cover the following five 12-digit HUCs: Yocum Creek 110100011307, Cow Creek 110100011401, Cricket Creek 10100011402, Brush Creek 110100011403, and Table Rock Lake Dam 110100011404. TRLWQ used a planning process that encourages local stakeholder participation and support. As of September 2012, the Eastern Table Rock Lake WMP is in the final stages of review.

Table Rock Lake Watersheds

OBJECTIVES

1. To protect and improve water quality in the watershed and Table Rock Lake by identifying pollutant sources and gathering pertinent data.
2. Identify better management of conservation practices to be implemented.
3. Set realistic goals and timeline for implementation.
4. Establish an evaluation and monitoring program to determine success of implemented projects/programs.
5. Increase success of future projects.
6. To help determine where water quality efforts should be focused.
7. Fulfill specific grant application requirements for securing future funding.
8. Assist other organizations and municipalities in water quality related efforts.
9. Provide insight for creation of more efficient implementation and/or education budgets for future projects.

METHODS EMPLOYED

- Watershed Management Plan
- 4 public/stakeholder meetings for WMP development
- Technical Committee collaboration, input, meetings
- News releases/Public Service Announcements (PSAs)/Watershed Priority Areas maps
- Annual Report
- Final Report

COOPERATING AGENCIES

- James River Basin Partnership
- Upper White River Basin Foundation (UWRBF)
- UMC Extension
- Lakes of Missouri Volunteer Program (LMVP)
- Natural Resources Conservation Service
- Stone County Commission
- Stone County Soil and Water Conservation District

CONTACT

Project Manager: Tammy Trantham
Table Rock Lake Water Quality, Inc.
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MDNR Project Manager: Valerie Hentges
Subgrant #: G10-NPS-05
Project Period: July 15, 2010 – July 1, 2012
FY08-09 319 (I) Grant: $15,000
Match: $10,000

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G10-NPS-06

Western Table Rock Lake Watershed Management Plan

Table Rock Lake Water Quality, Inc.; HUC #s: 110100010801, 110100010803, 110100010804, 110100010805, 110100010807, 110100010806, 110100010808, 110100011107, 10100011204, 110100011203 and 110100011202

PROJECT DESCRIPTION

The combined sub-watershed area surrounding Western Table Rock Lake is approximately 173,285 acres in size and located mainly in southwest Missouri (Stone and Barry counties) with parts in northwestern Arkansas (Washington and Carroll counties). The Western Table Rock Lake Watershed Management Plan (WMP) covered all or parts of the following eleven 12-digit HUCs. This WMP project was a locally lead effort administered by the TRLWQ, but directed by local residents, concerned citizens, business people, conservation offices and town/community service groups which would help create public support for the implementation of resulting WMP recommendations. As of September 2012, the WMP was going through the final review process.

OBJECTIVES

1. To protect and improve water quality in the watershed and Table Rock Lake by identifying pollutant sources and gathering pertinent data.
2. Identify better management practices to be implemented.
3. Set realistic goals and timeline for implementation.
4. Establish an evaluation and monitoring program to determine success of implemented projects/programs.
5. Increase success of future projects.
6. To help determine where water quality efforts should be focused.
7. Fulfill specific grant application requirements for securing future funding.
8. Assist other organizations and municipalities in water quality related efforts.
9. Provide insight for creation of more efficient implementation and/or education budgets for future projects.

METHODS EMPLOYED

- Watershed Management Plan
- 4 public/stakeholder meetings for WMP development
- Technical Committee collaboration, input, meetings
- News releases/PSAs/Watershed Priority Areas maps
- Annual Report
- Final Report

COOPERATING AGENCIES

- James River Basin Partnership (JRBP)
- Upper White River Basin Foundation (UWRBF)
- University of Missouri Extension
- Lakes of Missouri Volunteer Program (LMVP)
- Natural Resources Conservation Service (NRCS)
- Stone County Commission
- Stone County Soil and Water Conservation District (SWCD)

Contact

Project Manager: Tammy Trantham
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MDNR Project Manager: Valerie Hentges
Subgrant #: G10-NPS-06
Project Period: July 15, 2010 – July 1, 2012

FY08-09 319 (I) Grant:	$15,000
Match:	$10,000
Total funding:	$25,000

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G10-NPS-07

Applied Forestry Best Management Practices Training
Missouri Forest Products Association; Statewide

PROJECT DESCRIPTION

This training will provide hands-on, practical training of best management practices (BMPs) to loggers, foresters, and landowners in the state of Missouri. The class will count as continuing education for loggers who are trained for Professional Timber Harvester (PTH). PTH certification is required in the state of Missouri to operate on state forest land. This training will help to ensure harvesting operations are minimizing their footprints on the watersheds they are operating within, especially wetlands and other environmentally sensitive areas.

OBJECTIVES

The main objectives of this minigrant are:

1) Provide training participants with an overall understanding of the forestry related BMPs which are effective in reducing and/or preventing damage to watersheds during harvest.
2) Teach participants about stream crossing installation and the associated costs.
3) Teach participants how to calculate riparian buffer zones, and install waterbars/ditches/culverts/dips.
4) Show participants how to plan harvests, layout roads and skid trails, and properly slope roads.

Distance Between Turnouts & Waterbars		
Road/ Trail Slope (%)	Distance between Waterbars on Trails (ft.)	Distance between Dips or Turnouts on Roads (ft.)
1	400	500
2	245	300
5	125	180
10	78	140
15	58	Not Recommended
20	47	
25	40	
30	35	
35	32	
40	29	

METHODS EMPLOYED

- ✓ Each class will be taught by certified trainers John Tuttle from the Missouri Department of Conservation (MDC) and Brandon O'Neal from the Missouri Forest Products Association.
- ✓ Each training will begin with a two-hour classroom type introduction and review of basic BMPs. The remainder of the training will be hands-on in the field with small working groups.
- ✓ Skidders and dozers will be utilized during the training to provide actual practical application of the techniques learned.
- ✓ Master Loggers in the state of Missouri are subject to site audits to ensure BMP compliance and it is anticipated that all Missouri Master Loggers will attend this class.

Streamside Mgt. Zone (SMZ) Widths	
% Slope Adjacent to Stream	Width of SMZ Filter Strip on Each Side of Stream (ft.)
0	25
10	45
20	65
30	85
40	105
50	125
60	145

COOPERATING AGENCIES

Missouri Department of Conservation
Members of the Missouri Forest Products Association

CONTACT

Project Manager: Brandon O'Neal
Missouri Forest Products Association
Steve Jarvis, Executive Director
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Jefferson City, MO 65101
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MDNR Project Manager: Tucker Fredrickson/
Valerie Hentges
Subgrant #: G10-NPS-07
Project Period: August 1, 2010 – November 30, 2011
FY08-09 319 (Base) Grant: $7,500
Match: $5,000
Total funding: $12,500