# IOWA'S NONPOINT SOURCE MANAGEMENT PROGRAM

# 2011 ANNUAL PROGRAM REPORT

**Commented [L1]:** In the first round of EPA comments, I said this:
Water quality improvements must be included somewhere. This would be watershed projects that show incremental progress, meaning they are not yet ready to be delisted but are showing improvement. The success story publication mentioned later in this report gets at this a little bit but does not provide detail on all projects that are demonstrating a water quality improvement in the water body and why. This will rely on monitoring rather than just load reductions. My suggestion on this comes straight from the Satisfactory Progress Determination checklist that HQ produced.

I am not sure if you made any additions to the report. Please let me know if you did.

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## Introduction

Nonpoint source (NPS) pollution occurs when rainfall, snowmelt or irrigation water runs over land or through the ground, picking up pollutants and depositing them into lakes, rivers and groundwater. Nonpoint pollutants that threaten or impair designated uses in waterbodies originate from both agricultural and urban sources. Such pollutants include: sediment; excess nutrients (nitrogen and phosphorus) from sediment, fertilizers, animal manure, and other sources; herbicides and pesticides;; bacteria from livestock/pet wastes and faulty septic systems; and oil, grease, nutrients, bacteria. and toxic chemicals from urban and industrial sites.

Water quality is a direct reflection of watersheds and the land uses. Due to its rich natural resources for production agriculture, Iowa has become one of the most intensively cropped states in the country. While agriculture is not the only source of nonpoint pollution, it is definitely the primary source and the source providing the biggest challenge to address due to the sheer magnitude of the industry.

Addressing agricultural related nonpoint pollution represents not only the physical difficulty of trying to incorporated best management practices over so many acres, but also the challenge of trying to influence landowner attitudes. The agri-industrial complex of today is built upon generations of farmers who have been encouraged to maximize efficiencies mainly in terms of agricultural output.

In addition to the agricultural-related activities, urban runoff and stormwater discharges, atmospheric deposition, onsite residential wastewater disposal and waste disposal practices are causing negative impacts to the water resources of the state. These issues are being dealt with across the state in a variety of ways, through enhanced regulation, statewide information/education programs, and often as a component of a water quality project.

To address nonpoint source pollution, a comprehensive management strategy was developed by the state. Iowa's Nonpoint Source Management Program (NPSMP) dated September 2000, developed in cooperation with a number of water quality program partners, identifies Iowa's water resources, the nonpoint source impacts to our resources, and the variety of programs and partners which address nonpoint source issues. In addition, the NPSMP identifies the processes by which resources will be prioritized to ensure the needs of the state are met to the extent possible with the resources available.

The following annual report identifies the progress made during FFY2011 by the state in reaching the priorities and goals set forth by the NPSMP.

**Iowa's Nonpoint Source Management Program Vision**

Iowa's vision as stated in the Nonpoint Source Management Program (NPSMP) dated September 2000 is:

> ***To preserve and protect the quality of water resources of the state from nonpoint source impairments***.

To accomplish this vision, the state will support activities which will:

- increase the public's understanding of Iowa's water quality problems and treatment needs;
- encourage greater public involvement and participation in water quality programs;
- evaluate the status of the state's waters to ensure designated use criteria is being met;
- develop and implement coordinated restoration and water quality improvement plans that help preserve, protect and restore designated uses to surface waters and ground waters that have been impacted by nonpoint source pollution;
- provide technical assistance in the development of surface water and groundwater Best Management Practices (BMPs);
- promote the adoption of practices that reduce the impact agriculture has on the state's natural resources;
- reduce the impact of nonpoint source pollutants from urban lands;
- support surface water and groundwater monitoring efforts;
- integrate surface water and groundwater quality concerns within basins and watershed to more effectively protect and restore surface water and groundwater uses;
- provide increased opportunities for citizens to participate directly in water quality projects;
- implement measures to protect drinking water from the impacts of nonpoint source pollution; and
- evaluate, update and revise the NPSMP to reflect the most current Section 303(d) list of impaired waters, or every five years as needed.

In FFY2010, the Iowa Department of Natural Resources (DNR) began major efforts to update the NPSMP, as required by the Environmental Protection Agency (EPA). The DNR Watershed Improvement Program identified two main components needed in the new plan: compiling an inventory of existing nonpoint source programming in Iowa, and developing a vision of Iowa's nonpoint source pollution reduction goals and action steps. As part of the update process, the DNR Watershed Improvement Program began compiling an inventory of DNR programs related to nonpoint source pollution reduction, and it convened an internal DNR meeting to discuss new DNR nonpoint source programs created since the 2000 NPSMP was completed.

Beginning in early 2011, DNR continued gathering nonpoint source program information from partner agencies and stakeholder groups to compile a comprehensive inventory of nonpoint source programming in Iowa. The core partner agencies which provided an inventory of nonpoint source programming in Iowa included DNR, the Iowa Department of Agriculture and Land Stewardship Division of Soil Conservation (IDALS-DSC), Iowa State University (ISU) Extension, Conservation Districts of Iowa, and the Natural Resources Conservation Service (NRCS). The inventories of each core partner agency were compiled by DNR and incorporated into one inventory document that identifies the partnership's existing programs designed to address nonpoint source pollutants.

In addition to compiling an inventory of existing nonpoint source programming, the core partner agencies agreed that it was necessary to involve a group of stakeholder organizations to help create a statewide vision of what still needed to be done to address nonpoint source issues in Iowa. In order to help develop this statewide vision, DNR hired the University of Northern Iowa's Institute for Decision Making (UNI IDM), to facilitate a visioning process that included nonpoint source partner agencies and stakeholder groups to develop the vision component of the updated NPSMP. The core partner agencies identified 55 stakeholder groups with an interest in participating in a visioning process to update the NPSMP. To most effectively lead the visioning process, UNI IDM recommended that a group of no more than 30 individuals representing the stakeholder groups and partner agencies participate in a series of visioning sessions. To create the visioning session group, the list of 55 stakeholder groups was divided into 8 different categories, based on the type of organization represented. Of the different categories, stakeholder leaders in each of the categories were identified and were asked by UNI IDM to recruit other team members from their category to participate in the vision sessions. Through this process, the stakeholder team leaders selected the group of 20 stakeholders which made up the NPSMP visioning team. An additional 10 "seats" we reserved for the core partner agencies to participate in the visioning process.

Four visioning sessions of the stakeholder groups were held during the spring and early summer of 2011, with UNI IDM facilitating the sessions. During the visioning sessions, the stakeholder groups identified primary issues related to abating nonpoint source pollutants in Iowa. From these issues, the group then identified major goals, and objectives needed to improve water quality in the state. The core partners then convened several meetings of topic experts to develop a set of action steps needed to fulfill the 20 objectives that were identified by the visioning team.

In addition to conducting the visioning sessions, DNR, through UNI IDM, contracted with the ISU Sociology Department to conduct listening sessions with farmers and with urban residents in Iowa to gather input about their general understanding of water quality and nonpoint source issues in Iowa. A total of three farmer listening sessions and one urban session were held. The results were compiled in a document called "Water Quality Matters to Us All". Dr. Jacqueline Comito, of the ISU Sociology Department, who led the listening sessions, reported at one of the NPSMP visioning sessions about these

listening sessions, as a way to inform the visioning team and incorporate the issues identified by farmers and urban residents into the visioning sessions.

UNI IDM posted on its webpage the various documents developed through the NPSMP update process. These documents include the inventory of nonpoint source programming, summaries of each of the visioning sessions, and the "Water Quality Matters to Us All" report. These documents may be found at the website below: http://www.bcs.uni.edu/idm/index.html

The updated NPSMP is scheduled to be completed in the spring of 2012.

The following report identifies the specific goals Iowa has established to address the nonpoint source pollution issues of the state and summarizes the activities/projects conducted under each goal in FFY2011.

## Iowa's Section 319 Program

### Overview

Congress added Section 319 to the Clean Water Act in 1987 because it recognized the need to support state and local nonpoint source (NPS) pollution control efforts. The Environmental Protection Agency (EPA), through the Section 319 program, provides grant funds to states to implement NPS pollution control programs and projects.

In Iowa, the designated lead agency for the 319 program is the Iowa Department of Natural Resources (DNR). The DNR has received Section 319 funding annually since FFY90. While a portion of Iowa's funding is used to support program administration and implementation activities conducted by DNR staff, the majority is used to support 3 to 5-year implementation projects conducted by cooperating agencies such as soil and water conservation districts (SWCDs), county conservation boards, universities, and other state or federal agencies or private organizations involved in watershed protection efforts. Projects funded with 319 funding include NPS information and education programs, demonstration of innovative and alternative Best Management Practices (BMPs) for controlling NPS pollution, and implementation of NPS controls in priority watersheds.

Due to the predominance of agriculture in Iowa and the resulting impact of agricultural NPS pollution on Iowa's water resources, NPS control projects are primarily aimed at preventing and reducing agricultural pollutants. However, DNR has also funded projects that solely address urban concerns or include an urban component, if such is a concern in a targeted watershed. Projects that show a partnership of multiple local, state, and federal agencies, as well as private entities, are strongly encouraged. In addition, all projects must include an information and education component, and the use of new and innovative BMPs is encouraged.

The EPA Section 319 grant is divided into two separate parts: the Incremental portion and the Base portion. EPA requires that the Incremental portion of the state's Section 319 grant be targeted towards assessing and restoring the impaired waters of the state. The Base portion of the grant award supports the administration of the state nonpoint source program, in addition to supporting nonpoint source projects of a statewide nature or those that are designed to protect a waterbody from potential nonpoint impacts. Iowa's total Section 319 grant award from EPA for FFY2011 was $3,837,000. The amount of funding allocated by EPA to the Incremental portion of Iowa's FFY11 grant was $2,286,000, whereas the remaining $1,551,000 in funding was allocated by EPA to the Base portion of the grant.

### Application Process

A joint application process is used to obtain NPS water quality implementation project applications for funding consideration under the Section 319 program (administered by DNR), the state Water Protection Fund (WPF) and the Watershed Protection Program Fund (WSPF) (both administered by IDALS DSC). Many of the projects selected for

funding receive a combination of Section 319, WPF and WSPF, as well as funds from other agencies and private entities.

To be eligible for 319 project implementation funding, applicant watersheds are required to have a DNR-approved, 9-element watershed management plan (WMP). Since this eligibility restriction does not apply to WPF and WSPF programs, watershed project applicants may apply for WPF and WSPF project funding without applying for 319 funding. The DNR Watershed Implementation Grant provides 319 funding for the project implementation, either solely or jointly with WPF and WSPF matching funds. The DNR Watershed Planning Grant, initiated in 2009, provides funding for local watershed groups to develop WMPs to address impaired waters. Planning Grant funds were not included in Iowa's 2011 Section 319 grant application, however, due to the 2011 reduction in Iowa's Section 319 grant award.

The DNR Watershed Implementation Grant Request For Applications (RFA) and the Watershed Planning Grant RFA were sent January 25, 2011 to all 100 Soil and Water Conservation Districts (SWCDs) in Iowa, county conservation boards, and a variety of other organizations, agencies, and universities. Applications were due April 1, 2011. During 2011, a total of seven applications for joint project implementation funding requests (DNR 319 and IDALS DSC funding combined) were received, totaling $5,573,783 (including $3,882,181 in 319 funds and $940,118 in IDALS-Watershed Protection Funds), and one additional application was submitted for 319-only funding, totaling $758,500.

Project applications are reviewed and ranked by an inter-agency review committee based on criteria outlined in the NPSMP. The criteria includes the need for the project, suitability of project measures, budget, comprehensive workplan, potential for success and participation of others. A meeting was held May 24, 2011 with the inter-agency review committee members to meet and discuss individual comments and concerns.

Based on the recommendations of the committee and the department's needs in terms of addressing critical NPS issues, a workplan of proposed projects was developed and submitted to EPA Region VII for final approval in late July of 2011. EPA Region VII, awarded Iowa's FY2011 Section 319 grant in September of 2011, subject to EPA-approved revisions to project implementation plans and the completion of EPA-approved watershed management plans for selected projects. Upon award of the grant and completion of EPA requirements, contracts are developed with project sponsors and the project activities are initiated.

**Administration of Section 319 Program**

As the state agency having primary responsibility for implementation of Iowa's state Nonpoint Source Management Program (NPSMP), the Department of Natural Resources (DNR) must conduct numerous activities related to implementation of the overall NPSMP and the individual nonpoint pollution control projects being carried out in Iowa.

DNR's responsibilities in implementation of the overall NPSMP include: coordination at a state level of the nonpoint pollution control program and project activities of federal, state, and local agencies; review of federal programs and projects for consistency with the state's NPSMP; and, carrying out a variety of activities essential to implementation of the NPSMP, such as updating the NPSMP to reflect changes in federal and state laws and programs, responding to requests for information and assistance from the public, developing Section 319 grant applications and project implementation plans, and providing EPA with quarterly, annual, and final reports on the state's nonpoint source programs and projects.

DNR's responsibilities for implementation of individual nonpoint source pollution control efforts vary from project to project. For those projects receiving Section 319 funds, DNR's responsibilities are extensive, and include: solicitation and review of project proposals; selection of projects for which funding will be requested and development of grant applications and project implementation plans; negotiation with EPA on project funding; development of contracts or agreements for funded projects; and reporting of project achievements to EPA and the public. In addition, for some projects DNR has specific direct implementation responsibilities.

The DNR Watershed Improvement Program also provides assistance to local watershed groups to conduct watershed assessments through the use of Geographic Information System (GIS) technology, with direct technical assistance provided by a DNR GIS Specialist. The types of GIS watershed assessments conducted include land use assessments, streambank assessments, LiDAR-derived incised features assessments, gully assessments, livestock assessments, and urban assessments. With this assistance, local watershed groups developing plans and implementation projects are able to prioritize and focus efforts to areas and practices allowing for maximum water quality benefits. In addition, using the data obtained through this assistance, actual water quality benefits are more easily documented. The use of maps and other visuals produced with the GIS technology provides a tool to educate the public (including landowners, concerned citizens, public officials, school children, etc.) regarding watersheds and water quality issues.

Providing public information and education (I & E) continues to be an integral part of DNR’s role in implementing the NPSMP. To support a variety of NPS pollution I & E activities, Section 319 funding formerly provided for an Information Specialist position within the DNR Communications Bureau. This position assisted individual watershed projects with I & E efforts through the development of project brochures, fact sheets, newsletters, and public presentations. In addition, the Information Specialist position has been involved in a number of statewide NPS I&E efforts, such as developing an annual water quality success story publication, updating watershed improvement program annual reports, updating selected water quality project brochures, plus developing presentations for legislative presentations, TMDL and Section 303(d) meetings, animal waste issues, etc. The DNR Communications Bureau continues to provide communication support to the above efforts but, due to changes in that bureau’s functions, it now provides support to the DNR Watershed Improvement Program on an as-needed basis, upon request, rather

than through a position dedicated to NPS programming and funded by Section 319 funding.

**Progress toward achieving goals**:

Iowa's NPSMP identifies a number of short and long–term goals, objectives, and strategies to protect the states surface waters and groundwater from nonpoint source pollution. The progress made during FFY2011 toward achieving these goals is summarized below.

**GOAL: To continue and increase water quality protection and restoration on a watershed basis**

State and federal water quality funds support watershed project coordinators, information/education activities and financial incentives for a variety of best management practices (BMPs) to reduce sediment loading from erosion of cropland, streambanks, and construction sites; to reduce nutrient loading from commercial ag and lawn fertilizer, animal and wildlife wastes, and other documented sources; and to reduce bacterial loading from human wastes, animal and wildlife wastes, and other documented sources. BMPs employed include: nutrient and pest management programs, grassed waterways, grass/tree filter strips, wetland restoration, sediment basins, contour farming, pasture and hay land management, critical area plantings, streambank stabilization, stream corridor fencing, alternative watering systems, sinkhole and spring protection, no-till farming, animal waste management structures and grazing management. Urban BMPs, such as pervious pavement, rain gardens, and bioswales, allow runoff water to infiltrate into the soil in highly developed areas, instead of carrying pollutants directly into receiving lakes, streams, and rivers.

Although there were no water quality success stories submitted to EPA in FFY2011 for either the WQ-10 or SP-12 categories, Iowa DNR anticipates submitting several success stories in FFY2012 for Yellow Smoke Lake and Clear Lake. These anticipated success stories are due to new data showing water quality improvements in those watersheds.

During FFY2011 the following new water quality projects were developed through funding from one or more of the following programs--DNR Section 319, IDALS WPF and WSPF, DNR Lakes Restoration, state Publicly Owned Lakes Program, state Watershed Improvement Review Board (WIRB), and the NRCS Mississippi River Basin Initiative (MRBI). Section 319-funded project updates are available in the GRTS database. New projects which received 2011 Section 319 funding are labeled with an asterisk (*) below:

**Commented [L2]:** Where are updates for the other projects?

- Black Hawk Lake Watershed Project*
- Duck Creek Watershed Management Plan (DCWMP) Implementation*
- Price Creek Watershed Project*
- Competine Creek Watershed Project

- Onion Creek Watershed Project
- Coe Creek Watershed
- Clear Lake Enhancement and Restoration Project*
- Water Quality in Rathbun Lake 2011*
- Lake Hendricks Watershed Project
- Lake Icaria Watershed Project
- Twelve Mile Lake Watershed
- Walnut Creek Watershed Project
- Lost Island Lake Watershed Enhancement Project
- Spring Creek MRBI project
- Storm Lake MRBI project
- Cedar Creek MRBI watershed project
- Prairie Creek Watershed Project
- Big Creek Lake Watershed Project
- North Raccoon River MRBI project
- Headwaters North Fork Maquoketa MRBI project
- Bloody Run Creek
- White Oak Lake
- Walnut Creek
- Indian Creek
- Tuttle Lake

Section 319-funded projects include a water quality monitoring component to measure water quality changes resulting from project implementation. For new projects, the initial years (years one and two) of water monitoring provide baseline water quality data, whereas monitoring conducted in later years of a project (years thee and beyond) provide information as to whether water quality changes have taken place. Water quality monitoring in Iowa has shown that it is rare to document major changes in water quality in the short term.

**Watershed Planning and Implementation**

In FFY2011, the DNR Watershed Improvement Program continued to offer the DNR Watershed Planning Grant, initiated in 2009, as a way to provide financial and technical assistance to local watershed groups to develop a 9-element WMP. Eligibility for the DNR Planning Grant includes soil and water conservation districts, county conservation boards, cities and counties, and other public and private organizations capable of developing watershed management plans. Watershed eligibility for the DNR Planning Grant is limited to watersheds of 50,000 acres or less in size that drain to an impaired waterbody, in order to target watersheds small enough in size that water quality improvement can be measured. More information about the Planning Grant program is available on the following DNR webpage:

http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedPlanning/WatershedPlanningGrants.aspx

Also, DNR continued to offer its Watershed Action Plan guidebook designed as an Iowa-based template for local watershed groups developing a 9-element watershed management plan. The guidebook was based on the EPA Handbook for Watershed Planning. An electronic copy of the guidebook can be found on the Iowa DNR website below:

http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedPlanning/ManagementPlans.aspx

During FFY2011 one round of DNR Watershed Planning Grant applications were solicited, with applications due on April 1, 2011. A total of four applications were received, for a total request in grant funds of $176,969. Two applications were awarded (utilizing Planning Grant funds from previous years) to develop 9-elementWMPs for the following watersheds:

- Waterloo Creek (Allamakee County)
- Hickory Grove Lake (Story County)

The goal of the Waterloo Creek planning effort is to develop a Watershed Protection Plan, rather than a restoration plan, since Waterloo Creek is a high quality trout stream designated as one of Iowa Outstanding Waters. The goal of the Hickory Grove Lake planning effort is to develop a restoration plan that will address the lake's bacterial impairment.

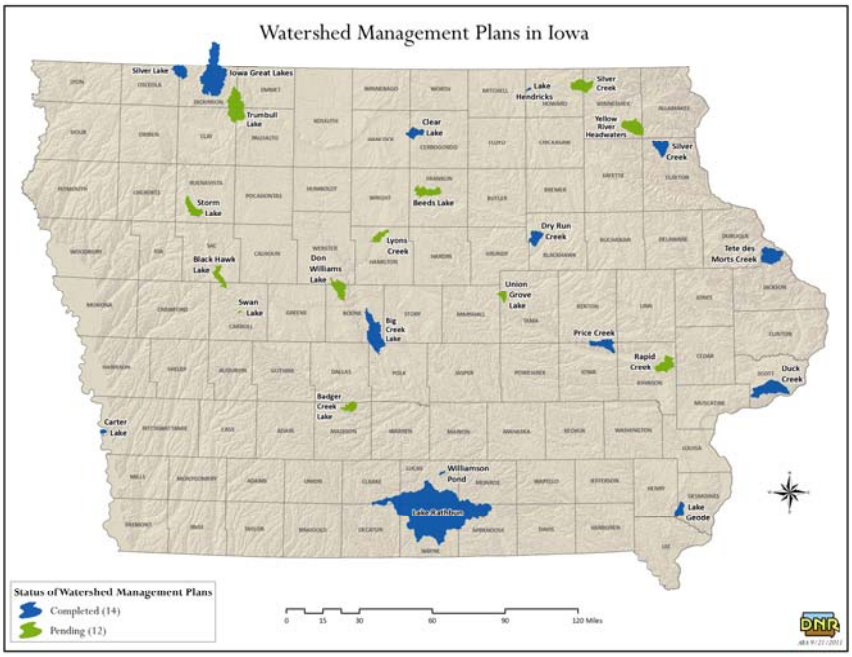
DNR Watershed Improvement staff (including Section 319 Project Officers and Basin Coordinators) and IDALS DSC staff (including Basin Coordinators) continued working with local watershed groups to provide them with technical assistance in developing 9-element WMPs. Since completing an approved, 9-element WMP is required before a watershed is eligible to receive Section 319 funding to implement a watershed plan, providing planning assistance to local watershed groups is nearly essential for that watershed to eventually be eligible to receive Section 319 project implementation funding. During FFY 2011, six 9-element WMPs were reviewed by EPA and approved by the DNR Watershed Improvement Program. These watersheds include:

- Clear Lake
- Black Hawk Lake
- Iowa Great Lakes
- Silver Lake (Dickinson County)
- Duck Creek
- Big Creek Lake

With the addition of the 6 new WMPs approved in 2011, there are now a total of fourteen approved WMPs (as of September 30, 2011) in Iowa. An additional twelve WMPs are currently being developed through local watershed groups, with ongoing assistance from DNR and IDALS DSC, and are considered "pending." A complete list of the fourteen approved WMPs is located on the Iowa DNR Watershed Improvement website:

http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedPlanning/ManagementPlans.aspx

A map showing the fourteen approved WMP areas and the twelve pending WMP areas is shown
below:




New Watershed Implementation Projects included in the DNR Section 319 FFY2011 grant application request to EPA, based on previously-approved WMPs, included:

- Clear Lake
- Duck Creek
- Black Hawk Lake
- Price Creek
- Water Quality in Rathbun Lake—2011

DNR received approval for funding and project initiation for the above projects in the fall of 2011.

The DNR Watershed Improvement Program partnered with IDALS DSC in 2009 to initiate an optional, supplemental water monitoring component to the DSC Watershed

Development and Planning Grant. Although the DSC Development Grant Program has resulted in useful watershed assessment data for grant recipients, additional water monitoring is often needed to help determine the specific locations and sources of water quality problems that may be the primary cause(s) of impairment in a watershed. For this reason, DNR agreed to add a DNR Water Monitoring Supplement grant in 2010, funded by Section 319 funds, to the DSC Development Grant to enable Development Grant applicants to apply for more funding from DNR to conduct additional water monitoring, if needed.

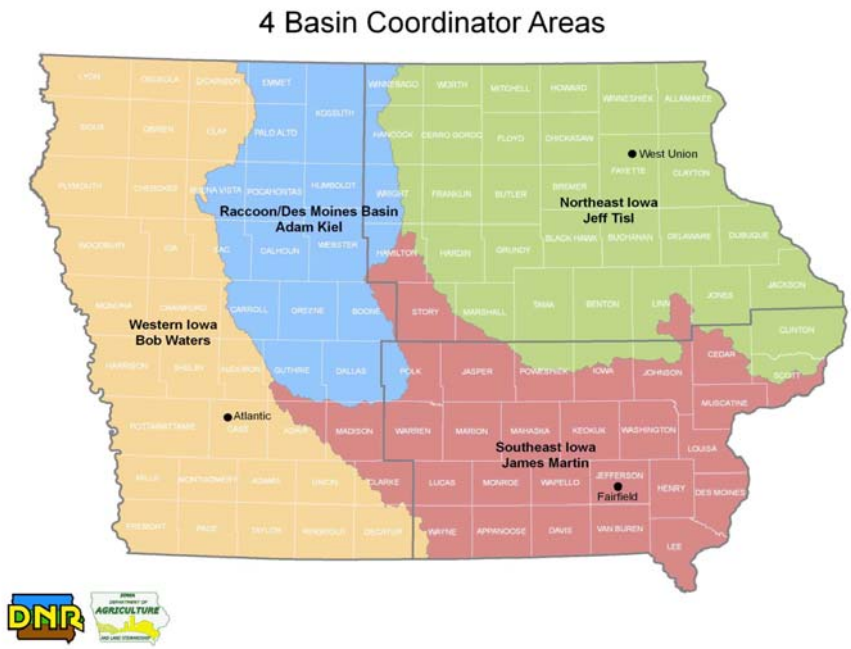
Applications for the DNR Water Monitoring Supplement are considered for SWCDs that are awarded a DSC Watershed Development and Planning Grant and that provide evidence that additional water monitoring is needed to help determine the specific locations and sources of water quality problems that may be the primary cause(s) of impairment(s) in the watershed.

In 2011, the following impaired watersheds received funding to conduct additional monitoring through the DNR Water Monitoring Supplement:

- Elk Run Creek (Carroll SWCD)

**Basin Coordinator Network**

In 2008, the DNR Watershed Improvement Program initiated a discussion within its core partnership (DNR, Iowa Department of Agriculture and Land Stewardship – Division of Soil Conservation, Natural Resources Conservation Service, and the local Soil and Water Conservation Districts) to explore rethinking and reshaping the approach used to deploy staff resources to more effectively support efforts to improve watershed management and improve water quality throughout the State of Iowa. As a result of this discussion, DNR and DSC established a network of four Basin Coordinators, with territories based on river basin boundaries, to provide assistance to local watershed groups in conducting watershed assessments, developing watershed management plans, and applying for watershed project implementation funding. Three of the Basin Coordinators are co-funded by DNR and DSC and are employed by DSC and one is fully funded and employed by DNR. The Basin Coordinators work with groups within their respective basin area, as shown on the map below (see Basin Coordinator map below).




In late 2010, DNR added a separate Basin Coordinator to facilitate watershed planning efforts in the Iowa and Cedar River basins. The recently added Iowa/Cedar River Basin Coordinator is actively supporting the U.S. Army Corps of Engineers Iowa River Basin Interagency Coordinating Team (IRBIACT), as well as the grassroots Cedar River Watershed Coalition. The IRBIACT, led by the Corps of Engineers, is working toward preparing a Watershed Plan for the entire Iowa/Cedar River Basin over the next several years. This staff position is also providing technical support to the Upper Cedar River, Indian Creek, Turkey River, and Catfish Creek watershed management authority processes that were initiated in late 2011.

Individuals assigned as DNR and DSC Basin Coordinators performed the following duties during FFY2011:

- Advise and serve as liaison between the DNR Nonpoint Source Pollution Management Program, the Iowa Department of Agriculture and Land Stewardship (IDALS) – Division of Soil Conservation (DSC), local watershed coordinators, Soil and Water Conservation Districts (SWCDs), and other local watershed groups.

- Facilitate local watershed planning and project meetings and activities, and advise and assist watershed coordinators, SWCDs, and other local watershed groups in the development and implementation of watershed management plans, and the development and implementation of watershed projects in accordance with the watershed plan and the watershed project plan of operations and budget(s).
- Assist and advise watershed coordinators in building linkages with technical resource personnel from state and federal agencies and with university research and outreach personnel, to facilitate technical inputs needed for achieving watershed plan and section 319 watershed project objectives.
- Offer and, where accepted, provide direct technical assistance to SWCDs, other units of local government, and other local watershed groups to assist them in the conceptualizing, organizing, and developing watershed management plans and implementation projects to address water quality protection and improvement.
- Initiate contacts and respond to requests from SWCDs and other local watershed groups for assistance, background information, and watershed management plan development advice.
- Seek input from local watershed groups on developing state watershed improvement priorities and target priority watershed areas for developing watershed management plans and subsequent watershed projects.

**IOWATER Volunteer Water Monitoring Program**

The IOWATER program is a volunteer water monitoring program located within the DNR Geological and Water Survey Bureau, Watershed Monitoring and Assessment Section. Water monitoring data collected by IOWATER volunteers provide preliminary information that is used by the Watershed Monitoring and Assessment Section to determine water monitoring priorities for its professional monitoring programs. Data collected by IOWATER volunteers are not considered "credible data" according to Iowa law, and therefore are not included in the state's 305b report.

In FFY 2011, the IOWATER program involved 3,615 volunteers across Iowa who collected water samples from 4,388 IOWATER registered sites. There are IOWATER registered monitoring sites in all 99 Iowa counties, plus eight counties in Minnesota and one county in each of the following neighboring states: Nebraska, Illinois, and South Dakota. The out-of-state sites are located on tributaries of Iowa waters.

More information about IOWATER may be found on the following webpage:

www.iowater.net

**Establish 7 volunteer monitoring programs annually in priority watersheds through water quality projects (NPSMP goal):**

In FFY 2011, the following watershed projects have established volunteer water monitoring programs:

- Duck Creek Watershed Project
- Spring Creek MRBI Project
- Competine Creek Watershed Project
- Lost Island Lake Restoration Project
- Storm Lake MRBI Project
- Black Hawk Lake Watershed Project
- Big Creek Lake Watershed Project

**Provide GIS maps for all water quality projects. GIS will be used to track BMPs installed and to calculate sediment, phosphorus, and nitrogen reductions as a result of the BMPs installed.**

The DNR Watershed Improvement Program employs a GIS Specialist whose primary duties are to provide GIS mapping assistance to prospective and current watershed projects and to calculate annual load reductions resulting from BMPs implemented through watershed projects. Typical GIS support to watershed projects includes assisting with assessments (land cover, stream and gully), analyzing data, and providing outputs used to target high priority areas to address impairments.

During FFY2011 the DNR GIS Specialist developed the following maps as part of the GIS assistance to watershed projects:

- Created 1,078 maps
- Developed 5 statewide maps of watershed projects, plans, and impaired waters
- Developed 70 HUC 12 level assessments for watershed projects and plans
- Developed 8 assessments at the HUC 8 level for basin planning
- Created 3 maps of municipal areas for preliminary watershed assessments

Load Reduction calculations: While final FFY2011 pollutant (sediment, phosphorus, and nitrogen) load reduction calculations have not yet been completed (the calculations are to be completed by February 15, 2012), the DNR Watershed Improvement Program expects to see load reduction numbers resulting from BMPs implemented through watershed projects during the federal fiscal year (ending September 30, 2011) to remain similar to the load reductions achieved in FFY 2010. These calculations were based on projects fully or partially funded by Section 319. Other project funding sources include the Watershed Improvement Review Board, DNR Lake Restoration, state Publicly Owned Lakes Program, Water Protection Fund (WPF), Watershed Protection Fund (WSPF), and State Revolving Fund (SRF).

During FFY2010 the following pollutant load reductions (for sediment, phosphorus, and nitrogen) were achieved through BMPs installed through Section 319-funded watershed projects in Iowa (see table below):

| Practice Type | Estimated Sediment Delivery Reduction (t/y) [1] | Estimated P Reduction (lbs/yr) [2] | Estimated N Reduction (lbs/yr) [3] | Number of Practices |
|---|---|---|---|---|
| Streambank | 656 | 853 | 1,312 | 9 |

| | | | | |
|---|---|---|---|---|
| Stabilization | | | | |
| Filter Strips | 414 | 538 | 120 | 20 |
| Misc BMPs | 1,921 | 2,497 | 9,570 | 46 |
| Sediment Basins | 8,805 | 11,447 | 19,582 | 104 |
| Waterways | 4,906 | 6,378 | 9,806 | 62 |
| Terraces | 7,393 | 9,611 | 12,468 | 140 |
| **Total** | **24,095** | **31,324** | **52,858** | **372** |

Incised Topographic Features Assessments:
A new GIS assessment tool was developed by DNR GIS staff in 2011 to show the depth of incised topographic features along streams to provide better information more quickly to assist local watershed groups with targeting smaller areas to conduct stream assessments. With these maps in hand, watershed coordinators can more quickly choose priority locations to conduct stream assessments and/or gully assessments, then more quickly determine the best locations for potential sediment control structures. These maps enable project coordinators to more quickly propose highly targeted BMPs to landowners, and are well suited to more quickly analyzing incised features in the southern Iowa drift plain region.

Land Cover/Soil Loss/Sediment Delivery Assessments
Watershed assessments using tablet computers are used to collect land cover, tillage, crop residue, and management information for priority watersheds. Using the land cover information and the RUSLE soil loss equation sheet and rill erosion maps are created representing the amount of soil erosion occurring in a watershed. The equation takes into account land cover and management, slope steepness, slope length, soil erodibility, and rainfall. Sediment delivery maps are created from the sheet and rill data taking into account such factors as the watershed's landscape position, size of the watershed and watershed shape. Additionally, any practices (i.e. terraces, waterways, filters, sediment control structures) installed are given an appropriate sediment reduction credit based on their trapping efficiencies. The sediment delivery maps are used to estimate the amount of sediment reaching the outlet of a watershed and to target "hot-spots" for targeted conservation practices. See maps 1-3 for example.

Stream Assessments
The stream assessment procedure, entitled RASCAL (Rapid Assessment of Stream Conditions Along Length), was developed in 2006 and refined in 2007 to inventory in- and near-stream characteristics such as bank erosion, substrate, aquatic habitat, riparian cover, livestock access and more. The procedure requires watershed project personnel to walk the length of stream being assessed and note conditions using a GPS equipped PDA. When complete, the data and resulting maps are used to identify possible areas for targeted BMP implementation.

Gully Assessments
Gully erosion has become an area of focus for some of Iowa's watershed projects. During FY07 an assessment tool similar to the RASCAL was developed to assess erosion from classic gullies. The assessment tool collects gully length, depth, recession rate, and

location data. The resulting data is used to quantify sediment loading from specific locations as a means to identify and target gullies contributing high amounts of soil to priority waterbodies.

Examples of GIS assessment maps developed by DNR for watershed projects are found in Appendix C.

Several Section 319-funded projects address water quality issues on a statewide or regional basis, rather than a watershed basis. For example, Iowa Learning Farms is an educational and demonstration project that involves cooperating farmers across the state. Another statewide project, the River Use Survey, surveyed Iowans' use of rivers across the state as a way to assist the state in prioritizing future water quality improvement efforts for rivers. Also, the Small Feedlot Education Project is developing water quality information to owners and operators of small beef and dairy feedlots across Iowa.

The following are Section 319-funded projects that in FFY2011 demonstrated and evaluated Best Management Practices or that provided technical assistance or information on a regional or statewide basis:

- Comprehensive Water and Agricultural Policy Coordination
- Wetland and Coldwater Trout Stream Restoration Mini Grant Project
- Iowa Learning Farms Project
- River Use Survey
- Small Feedlot Education Project
- Community Assessment Tool Development Project
- Statewide Mussel Survey
- Raccoon Master Plan

Project summaries of the above projects can be found in EPA's Grants Reporting and Tracking System (GRTS). The summaries provide additional details of the projects, water quality impairments, practices being implemented, funding provided, and project partners. In addition, the Section 319 project allocations for each project can be found in GRTS. More information may be found on the EPA GRTS website: http://iaspub.epa.gov/pls/grts/f?p=110:1

Although the projects have been categorized by primary type of project, many of the projects have multiple components, such as many of the lake, coldwater stream or warm water stream projects that also address urban NPS issues. All of the projects have an information/education component which includes activities such as: field days, press releases, brochures, demonstration site signs, school and public meetings, etc.

In 2011, the DNR Communications Bureau undertook a number of projects to promote the DNR's Watershed Improvement Section programming and efforts to provide information and education on a watershed basis.

The quarterly e-newsletter, *Clean Water Starts with Us*, continued in 2011. It was developed for current and potential clients, including existing and prospective watershed projects, SWCDs, county conservation boards, and the core nonpoint source partner agencies. Copies of each quarterly newsletter developed since 2008 are available on the following DNR webpage:
http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedNews.aspx

The Communications Bureau also led an effort to promote the recreational and environmental benefits of the newly renovated Kiowa Marsh with a highway sign, educational kiosk, news releases and direct mail. More information about the Kiowa Marsh project may be found on the following DNR webpage: http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedSuccesses/KiowaMarsh.aspx

In FFY2011, the DNR Communications Bureau completed the following projects related to nonpoint source and water quality programming:

- Distributed more than 700 copies of the annual NPS success story publication
- Sent at least seven news releases about watershed projects
- Sent at least two dozen press releases about manure spills, fish kills, and other water quality-related announcements
- Sent watershed grant information more than 400 people and organizations
- Developed presentation materials for DNR staff presenting at the SWIM workshop, CDI conference, and the Iowa Rivers Revival conference
- Delivered communications materials and information to 10 watershed coordinators

More information may be found in the GRTS database.

Some of the other major activities conducted through the Section 319 information/education staffing support include:

- Developed "Working for Clean Water: 2011 Watershed Improvement Successes in Iowa," an annual publication since 2007 that highlights eight success stories of Iowans improving their streams, rivers and lakes.
- Developed promotion plans for the DNR Watershed Planning Grants and DNR Watershed Implementation Grants, maintaining a list of target audiences and creating e-mail blasts, fact sheets, news releases and more to reach potential grant applicants and encourage them to apply.
- Prepared news releases and other materials for TMDLs.
- Prepared news releases for EcoNewsWire and for various publications, announcing success stories, pollutant reductions, calls for grant applications, etc.
- Sent a monthly listserv message to watershed coordinators announcing training and grant opportunities, as well as other items of interest to coordinators
- Maintained the Watershed Improvement section of the DNR website.
- Created display materials for conferences, shows and meetings.
- Provided guidance and critiques to watershed project coordinators on newsletters, news releases, websites and other communications products.

The DNR watershed publications may be found at the website below: http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedNews.aspx

**GOAL: To protect and restore waters identified by the 1998, 2002, 2004, 2006 2008 and 2010 Section 303(d) list of impacted waters by Nonpoint Source Pollution, TMDLs will be developed and implemented.**

During FFY11, TMDLs were submitted and approved for 4 waterbodies and 8 impairments. These included:

- Union Grove Lake: Algae, Turbidity, pH, Bacteria
- Lake of Three Fires: Bacteria
- Duck Creek (2 Segments): Bacteria
- Big Creek Lake: Bacteria

In addition, TMDLs have been completed and submitted to EPA for the following 4 waterbodies and 7 impairments:

- Silver Creek: Sediment, Ammonia
- Black Hawk Lake: Algae, Turbidity
- Dry Run Creek: Connected Impervious Surface
- Briggs Woods Lake: Organic Enrichment/Low DO, Algae

Development of TMDLs was initiated and/or continued on the following waterbodies:

- Dick Creek: Biological
- Lyons Creek: Biological
- Marrowbone Creek: Biological
- Long Dick Creek: Biological
- Walnut Creek: Biological
- Yellow River (6 tributaries): Low Dissolved Oxygen & Bacteria
- Hannen Lake: Algae, pH, Ammonia & Turbidity
- Lake Keomah: Algae, pH, Bacteria
- Beeds Lake: Algae
- Casey Lake: Algae, Turbidity, pH

The completed TMDLs can be found at the following site:
http://www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedResearchData/WaterImprovementPlans/PublicMeetingsPlans.aspx

Watershed Projects were active in the following watersheds to address the impairment(s) identified by a completed TMDL:

- Clear Lake Water Quality Protection Project
- Lake Darling Water Quality Improvement Initiative
- Black Hawk Lake
- Littlefield Lake Nonpoint Source Watershed Project
- Silver Lake Watershed Project
- Williamson Pond Watershed Project
- Lake Geode
- Lyons Creek

- Big Creek Lake Watershed Project
- Duck Creek

Additional water quality projects were supported in watersheds of waters listed on the Section 303(d) list of impaired waters, even though a TMDL has not yet been approved. These projects include:

- Rathbun Lake Special Project
- Upper Iowa River Watershed Project
- Whitebreast Creek Watershed Restoration Project
- Tete des Morts Watershed Project
- Muchakinock Creek Watershed Project
- Jordan Creek Watershed Project
- Clear Creek Water Quality Project
- Prairie Rose Lake Water Quality Project
- Prairie Creek Water Quality Project
- Lake Hendricks Water Quality Project
- Dry Run Creek Water Quality Project

The TMDL Program views public participation as an integral part of improving water quality. It is important to have buy-in from stakeholders, including local citizens, land owners, and other special interest groups, otherwise water quality improvements will be difficult to achieve through a voluntary process. For each TMDL developed, a minimum of two public meetings are held near the impaired water body to promote action from the local community. The first of these public meetings is to inform the stakeholders that a TMDL is being developed; the second is to present the draft TMDL before it is sent to EPA for approval. Comments received from the public are taken into account when developing and finalizing the TMDL. Press releases are issued through the DNR's EcoNewsWire. This weekly press release is sent to approximately 175 press agencies throughout Iowa. In addition, since FFY07, local stakeholders such as County Conservation Boards and Soil and Water Conservation Districts have promoted local public meetings, resulting in higher attendance at public meetings.

Public meetings were held during FFY11 regarding each of the following waterbodies for which TMDLs were being developed:

- Black Hawk Lake
- Briggs Woods Lake
- Dry Run Creek

Water quality monitoring and assessment is a significant activity in the development of TMDLs. IDNR entered into a contract with the State Hygienic Laboratory (SHL) to provide monitoring and assessment services. The following section highlights the activities completed for the referenced waterbodies.

**Water Quality Monitoring and Assessment, Streams**

Base flow (bi-weekly or monthly), event sampling (auto samplers gauged to respond to increased stream stage) and diurnal dissolved oxygen and temperature monitoring (two to three week intervals) was conducted on the following streams:

- Willow Creek
- Middle Fork Grand River
- Peck Creek

A variety of chemical analyses is completed, including biochemical oxygen demand, pH, chloride, phosphorus, chlorophyll, dissolved solids, carbon, dissolved oxygen, suspended solids, turbidity, *E. coli*, and nitrogen.

**Biological Assessment Sampling of TMDL Streams**

Field activities and laboratory sample analysis are conducted for the following impaired section of the identified streams:

- Bear Creek
- Paint Creek
- Burr Oak Creek
- Bailey Creek
- Pleasant Creek
- Jackson & West Jackson Creeks
- Walnut Creek
- Skillet Creek

Field activities include sampling aquatic biota, assessing stream habitat, stream flow, and a variety of field measurements. Laboratory analyses include benthic macroinvertebrate, fish species and water sampling

**Water Quality Monitoring and Assessment of Lakes**

The following lakes are sampled to collect data used to develop and complete the TMDL:

- Otter Creek Lake
- Little River Lake
- Beaver Lake
- Kent Park Lake
- Central Park Lake
- Thayer Lake
- Lake Pahoja

**GOAL To restore designated uses in streams/lakes where manure from confined animal operations is causing impairments**

High concentrations of ammonia-nitrogen in streams that feed the Raccoon River, the primary source of drinking water for the Des Moines metro area, combined with observations of widespread manure application in February 2008, led to a statewide discussion about the need to limit winter manure application. DNR played a major role in developing a new law restricting the application of manure on frozen or snow-covered ground. The law, Senate File 432, prohibits the surface application of liquid manure on

top of snow-covered ground from December 21st to April 1st and on frozen ground from February 1st to April 1st, except in emergencies. The law does not apply to dry manure or manure from small animal feeding operations. DNR adopted rules to enforce this law and field office staff track instances of emergency application. Each year a summary of emergency applications is provided to the Iowa Legislature.

The first step towards addressing manure issues is to determine where livestock and poultry facilities are, how many animals they have, and what their current manure storage and management practices are. DNR has recently developed two web applications that allow the public to search animal feeding operation data by watershed and view the history of permits, inspections, and complaint investigations at these facilities. These applications are the Animal Feeding Operations database and the Field Office Compliance database. Staffing for compliance and enforcement of confinement animal feeding operations has been drastically cut this year, so DNR will need the public's help to assure compliance with state regulations. These databases will also allow producers to access information about their permits and should reduce the time that staff spends answering questions about due dates and records.

DNR has worked to encourage voluntary improvements to manure management across the state through the funding and technical support for watershed projects and educational efforts. For example, DNR staff have assisted with mapping, sampling, and coordination of the Brushy Creek Watershed project led by Des Moines Water Works and funded by WIRB (the Watershed Improvement Review Board).

In the fall of 2010, DNR initiated the Small Feedlot Education Project, funded primarily with Section 319 funds. Through this project, DNR staff, led by the DNR AFO Coordinator, are working with partners from NRCS, IDALS DSC, ISU Extension, plus beef and dairy industry partners, to develop a coordinated educational program for owners and operators of small feedlots (smaller than 1,000 animal units in size) to address the water quality impacts of small open feedlots. Handbooks and practice fact sheets are being developed by ISU Engineering staff to assist with educating producers of the impacts open feedlot runoff can have on water quality. In addition, a 10-minute educational video demonstrating water sampling and testing for ammonia has been developed. Also, an associated fact sheet will assist producers and service providers to properly use water monitoring test kits that will be provided through ISU Extension offices to enable producers to conduct their own sampling of the water quality in streams below feedlots. Field days at demonstration sites are being planned to let producers educate other producers on what can be done to proactively protect water quality.

Projects such as the Statewide Manure Management Education Initiative provide information and education programs to producers and service providers to assist in the making of appropriate decisions about the utilization of manure and manure nutrients. Programs such as the Iowa Manure Management Action Group (IMMAG) and the Iowa State University Extension Manure and Nutrient Management Workshops are supported through this project and have proven successful through the numbers of attendees, hits on the web sites, and copies of requested newsletters. The IMMAG website is also being

used to post information produced through the Small Feedlot Education Project. http://www.agronext.iastate.edu/immag/smallfeedlotsdairy.html

Several Section 319-funded watershed projects address animal waste issues by providing technical and financial assistance for BMPs such as renovating open feedlots, installing manure storage facilities, diverting runoff away from livestock areas, providing alternate water sources, fencing livestock away from streams, and other practices. For example, the Tete des Morts Creek Watershed Project is focusing on 8 high priority open feedlot sites that have been discharging animal waste directly to the creek. The project coordinator is working directly with the owners of the feedlot to redesign or renovate the open feedlots to reduce or eliminate the feedlot runoff in a manner to improve the creek's biological impairment. As of the end of FFY2011, the project had successful addressed six of the eight high priority feedlot sites. More information about the Tete des Morts Creek project (and other projects) may be found in the GRTS database.

The Section 319-funded projects which addressed animal waste issues in FFY 2011 included:

- Lake Macbride Watershed Project
- Brushy Creek Lake Watershed Project
- Staff and Beaver Creeks Water Quality Project
- Jordan Creek Watershed
- Price Creek Water Quality Project
- Hannen Lake Watershed Project
- Silver Creek Watershed Management
- Lyon County Clean Water Demo
- Silver Lake Watershed Project
- Tete Des Morts Watershed Project
- Lake Geode Nonpoint Source Watershed Project
- Williamson Pond Watershed Project

**GOAL: To develop and implement appropriate nutrient management plans on agricultural land in Iowa**

An interagency effort to develop a statewide nutrient strategy was developed in October of 2010, with the effort divided into two separate parts: a nonpoint source component and a point source component. IDALS and the Iowa State University College of Agriculture have been leading the effort to develop the nonpoint source component of the statewide nutrient strategy. As part of that effort, IDALS has convened an interagency committee of researchers to review the science of different nutrient reduction strategies from nonpoint sources, and a separate committee has convened to discuss ways to provide outreach to the public about various nonpoint source nutrient reduction strategies. The DNR Nonpoint Source Section 319 Program has not been included in the development of the nutrient nonpoint source strategy.

The point source component of the statewide nutrient reduction strategy is being led by the DNR's Water Quality Bureau, which regulates point source discharges in Iowa. As part of this effort, DNR is leading an interagency task force to review and develop nutrient reduction strategies from point sources. The strategy is expected to be completed in 2012.

A webpage has been established through Iowa State University to provide public information on future updates in the development of the nutrient strategy (see below): http://www.ag.iastate.edu/nutrientstrategy/

In addition to the development of the statewide nutrient strategy, Iowa's updated NPSMP (described in a previous section) will include strategies and practices to address the impact of nutrients on Iowa's lakes and streams.

Based upon the recommendations of the Nutrient Science Advisory Committee report completed in 2008 (http://www.iowadnr.gov/water/standards/files/nsa_08feb14.pdf), a nutrient standard for recreational use in Iowa lakes has been developed and was submitted to the Environmental Protection Commission as a Notice of Intended Action at its January 18, 2011 meeting. This effort has been delayed to allow for the development of an Iowa nutrient reduction strategy consistent with EPA's nutrient reduction framework (March 2011). The strategy will include a workplan for developing nutrient criteria.

A team of DNR scientific staff has been formed to develop a plan of work to develop nutrient standards for Iowa streams. In addition, a separate interagency technical advisory committee has been established to assist with the development process. Information about the work of the team can be found on the DNR website at:
http://www.iowadnr.gov/water/standards/nutrients.html.
The technical advisory committee is expected to produce nutrient criteria recommendations for Iowa streams in 2012.

Other Information is available at the Iowa DNR Nutrients and Water Quality Website at: http://www.iowadnr.com/water/nutrients/index.html.

The Iowa Learning Farms Project (ILF) is an example of a statewide project supported by multiple agencies and partners that addresses nutrient issues related to agriculture. ILF is an ongoing farmer educational project administered by Iowa State University jointly funded by DNR Section 319, DSC, NRCS, the Leopold Center, and supported by CDI, ISU Extension, Iowa Farm Bureau, Iowa Soybean Association, and other private organizations. The purpose of the project is to utilize farmer partners, in conjunction with ISU researchers, to demonstrate innovative conservation farming practices implemented on their farms through farmer-to-farmer networking. For more information about Iowa Learning Farms, see the project weblink below:
http://www.extension.iastate.edu/ilf/

Several individual watershed projects address nutrient management issues by providing technical and financial assistance to develop nutrient management plans, to install BMPs that also require the development of nutrient management plans (as required by EQIP funds administered through the NRCS Mississippi River Basin Initiative), and by providing technical and financial incentives for cover crops and other cultural practices. More information about BMPs implemented through 319-funded watershed projects may be found in the GRTS database.

Watershed projects that in FFY 2001 addressed nutrient management issues included:

- Rathbun Lake Special Project
- Brushy Creek Lake Watershed Project
- Staff and Beaver Creeks Water Quality Project
- Clear Lake Water Quality Protection Project
- Camp Creek Watershed Project
- Clear Creek Water Quality Project
- Badger Creek Lake Watershed Planning
- Hannen Lake Watershed Project
- Dry Run Creek Water Quality Project
- Price Creek Water Quality Project
- Lake Geode Nonpoint Source Watershed Project
- Black Hawk Lake Watershed Project

**GOAL: To implement stormwater programs to reduce NPS impacts from stormwater and construction site runoff**

The Urban Stormwater Management project has successfully provided outreach to MS4 city elected officials and staff, developers, contractors, and builders. Such things as the development of a model post-construction stormwater ordinance, the maintenance of the Iowa stormwater website (iowastormwater.org), meetings with stakeholders, the development of a SWPPP checklist to be used by MS4 communities, and technology transfer of erosion and sediment control design standards and specifications have raised awareness about stormwater. Other state agencies such as the Department of Economic Development and the Department of Agriculture and Land Stewardship are incorporating improved stormwater management into their programs and staffing. In addition, DNR staff is implementing the storm water program strategy at the Department field office level.

Ongoing individual DNR sponsored and partner agency funded projects which address stormwater and construction site runoff by implementing urban or stormwater BMPs include:

- Clear Lake Enhancement and Restoration Project
- Upper Catfish Creek Water Quality Project
- Infiltration-Based Stormwater Management in Iowa's Great Lakes Region
- Assessment and Management Plan for the Iowa Great Lakes Watershed
- Dry Run Creek Sub-Watershed Retrofit and Bank Stabilization Project

- Silver Lake (Palo Alto)
- Carter Lake

Iowa State University's Center for Transportation Research and Education completed design standards for post-construction storm water quality best management practices. The standards are included in an updated version of the Iowa Stormwater Management Manual (ISMM) (formerly called Statewide Urban Design and Specifications (SUDAS) Manual) and are being funded with storm water permit fees. A web link to the design guidelines are posted on the web at:
http://www.intrans.iastate.edu/pubs/stormwater/index.cfm

All of the various Iowa storm water individual and general permits can now be accessed on the web at: https://facilityexplorer.iowadnr.gov/FacilityExplorer/Default.aspx

**IJOBS**
A one-time state program called "IJOBS" was developed in Iowa by then-Governor Culver in response to the 2008 recession to provide financial assistance to update aging urban stormwater infrastructure and to stimulate job creation in the state. Through this program, approximately $1.25 million in IJOBS funding was administered by DNR through a grant program. Grant applications were solicited through a Request for Proposals made available to public and private entities, including cities, counties, colleges, and churches, to retrofit parking lots, streets, and other "urban" infrastructure with BMPs that would infiltrate runoff and demonstrate infiltration practices.

The majority of the projects selected for IJOBS funding were installed during FFY2011. Below is a list of the IJOBS projects implemented in the state:

- St. Paul Cathedral Church – bio retention, native landscaping, porous pavement
- North Liberty – Pervious pavement, rain gardens, bio swales, infiltration trenches, native plantings
- Carter Lake – Rain garden, bio retention, bio swale
- Ackley – Pocket wetland
- Ames – Bio retention cells
- Luther College – Pervious Pavers
- Eastern Iowa Regional Housing Authority – Rain gardens
- Charles City – Pervious paving, cobble infiltration, bio retention area
- Belle Plaine – Sediment basins, bio retention cells/filtration systems, pervious paving
- West Union – Rain gardens
- Mason City – Green Roof
- Indigo Dawn – Soil reclamation, bio swales, pervious pavers, rain gardens, native landscaping, water conservation, grey water reclamation, rain water harvesting, vegetated roof
- Davenport – bio-retention cells
- Clive – stormwater detention basin and channel restoration

- Cedar Rapids Water Tower – Green Roof
- Ankeny – Buffer, pervious trail, rain garden / bio retention cell

**NPS Pollution on Urban Landscapes**

Efforts have been underway to develop urban conservation services in Iowa for over ten years. After a slow start, progress is now being made. Past efforts were primarily funded by the 319 program and featured strong educational programs and demonstrations of Best Management Practices. Efforts have shifted to specific watershed treatment projects and are increasingly being funded by money from state programs.

Current efforts focus on improving erosion and sediment control on construction sites and managing storm water runoff for water quality protection. Storm water strategies have featured infiltration-based practices that manage the water quality volume (or runoff from up to 1.25") of rain. Stabilization of urban stream corridors is becoming another priority.

In 2008 a major advance in urban conservation occurred by the creation of an Urban Conservation Program, including the creation of five urban conservationist positions, within the Iowa Department of Agriculture and Land Stewardship. Four positions are located in Soil and Water Conservation Districts (West Pottawattamie, Dickinson, Polk and Johnson SWCDs). One position, the Urban Conservation Program Coordinator, is located in the central office of IDALS Division of Soil Conservation in Des Moines.

The other significant step that occurred in 2008 was the adoption of local stormwater ordinances that require the management of the water quality volume through infiltration-based BMPs for all new development. These ordinances were adopted by the cities of Okoboji, Spirit Lake, Wahpeton, and by Dickinson County, all of which are located wholly or partly within the Iowa Great Lakes watershed, where two 319-funded projects have been ongoing. These two projects included the Iowa Great Lakes Assessment Project and the Iowa Great Lakes Infiltration Project. Also in 2008, Dubuque County adopted a Low Impact Development ordinance for new development, largely due to the educational and demonstration activities conducted by the 319-funded Upper Catfish Creek Watershed Project. It is expected that the institutionalization of stormwater management for water quality protection will continue to result from the educational programs and BMP demonstrations that were funded by the 319 program in recent years.

The counties that had or currently have established urban conservation projects include: Dubuque County, Scott County, Johnson County, Jefferson County, Linn County, Black Hawk County, Buena Vista County, Dickinson County, Polk County, Story County, Pottawattamie County and Mills County. Wapello and Warren Counties are in the process of starting up urban projects. A summary of FFY2011 Urban Conservation Program accomplishments is listed below.

**FFY2011 Urban Conservation Program Activities**

<u>Dickinson County SWCD:</u>

In 2011, installation of bioswales and biocells in a rural subdivision was completed. Gravel roads were converted in the East Okoboji Beach development to concrete and the road ditches were retrofitted into bioswales, with strategic biocells installed in a few locations. Sediment loading into East Okoboji Lake was essentially eliminated by removing the major source of sediment and infiltration of runoff from most rainfall events. Beyond the larger East Okoboji Beach project, the district completed another 10 projects where they assisted with cost share. The total of those ten projects have treated approximately 700,000 gallons of water.

Education efforts were started with Iowa Lakes Community College in Emmetsburg to bring storm water management practice to the landscape program students. Other education programs were given to the City of Spencer and Spirit Lake planning and zoning commission and the Dickinson County Council of Governments.
Planning work in 2011 has lead to projects to be started in 2012 in Dickinson County, Spirit Lake, Arnolds Park, and Okoboji with possible projects in Storm Lake, Spencer and Emmetsburg.

West Pottawattamie County SWCD:
A major education and outreach program was initiated with assistance of a REAP CEP grant. The program is a partnership between the West Pottawattamie SWCD and Iowa Western Community College. The program provides training sessions for landowners to inform them on the benefits of infiltration-based stormwater management programs and to generate customer demand for designers and installers of landscapes that manage water more sustainably. Simultaneous training sessions were conducted for design and installation professionals to ensure that technically sound vendors are available to meet growing customer demand for green infrastructure.

Polk County SWCD:
The Des Moines Area Community College (DMACC) completed a watershed project that treats campus runoff that enters DMACC Lake. The project installed a wide range of practices that included:

- stream corridor stabilization,
- installation of an innovative forebay at the end of the stream corridor that included a multi-tiered outlet system to provide treatment to a range of rainfall and runoff events
- native buffers
- a vortech device
- and a stormwater wetland

A conservation subdivision that features a treatment train of green infrastructure is being installed to treat the rest of the watershed above DMACC Lake.

Johnson County SWCD:
Urban Conservationist, Amy Bouska, initiated an outreach program to Sustainability Coordinators at Colleges and Universities in Eastern Iowa. The goal of the outreach efforts was to develop partnerships and provide training on infiltration based stormwater

management strategies. A number of Rainscaping training sessions were also conducted along with a tour for members of the Iowa Stormwater Education Program. A highlight of the training efforts included a session on Soil Quality Restoration that included field demonstrations on restoration techniques. The Johnson SWCD also assisted the County P & Z office draft and adopt a stormwater ordinance that requires on-site infiltration of the water quality volume – or runoff from a 1.25 inch rain – which manages runoff from about 90% of rainfall events.

Dubuque County SWCD:
The Dubuque SWCD completed the Catfish Creek Watershed Project, which helped protect a cold water trout stream. The urban component of the project was highly successful. Project Coordinator Eric Schmechel helped Dubuque County draft and adopt a stormwater ordinance that requires on-site infiltration of the water quality volume – or runoff from a 1.25 inch rain – which manages runoff from about 90% of rainfall events.

The MS4 cities of Dubuque and Asbury have since adopted similar ordinances, as has Epworth – a non MS4 community. Peosta is another non MS4 city that is also considering adoption of a similar ordinance. Upon completion of the watershed project, the cities of Dubuque and Asbury along with Dubuque County entered into a 28E agreement with the SWCD and provided funding for an urban conservationist position to continue technical assistance for the urban and urbanizing landscapes. The Urban Conservationist also provided valuable input in the planning of a major project to daylight an old undersized storm sewer to create an open channel that will contain flood flows. The project will include treatment of stormwater before entering the channel to protect water quality as well as provide fish habitat, a recreational trail, and educational features. The Urban Conservationist is also assisting Dubuque County in development of a regional Smart Plan and is providing assistance in the development of a Watershed Management Authority for the Catfish Creek Watershed.

Duck Creek Watershed Project (Scott County):
Scott County SWCD applied for and received a 319 grant that will fund the first fully urban watershed project in Iowa. The project will focus on retrofitting built out areas with infiltration-based practices and ensure water quality protection is included in new development within the watershed. Scott SWCD also assisted in the development of soil quality restoration (SQR) services and created strong customer demand for SQR. This is a significant development, since SQR provides the greatest opportunity to treat the largest land mass, in the least amount of time, and at the lowest cost – compared to other water quality BMPs for stormwater runoff.

Clear Lake Enhancement and Restoration Project:
Urban conservation practices continued to be installed in Cerro Gordo County as part of the Clear Lake Enhancement and Restoration Project. Previously, the majority of the urban conservation practices installed were grit collections chambers to treat runoff that had already entered into the storm water drainage system. In 2011, infiltration based practices were focused on to help reduce the amount of runoff entering the storm drain system and then into Clear Lake. Practices installed in 2011 included three rain gardens,

one permeable paver block driveway, one pervious concrete parking lot, and one storm water infiltration trench. As a result of the practices being installed, up to 21,000 gallons of contaminant-laden storm water runoff will no longer reach the lake during each rain event. The BMPs identified above will be entered into GRTS when the project has been completed.

Black Hawk County SWCD:
Dry Run Creek Watershed Project Coordinator, Phil Schuppert, was hired by the city of Waterloo to manage their stormwater program. Ashley Kittle was hired as the new Watershed Conservationist in September. The Dry Run Creek Project continues to implement projects and show benefits. In FFY2011, permeable pavement was installed at three locations on the University of Northern Iowa campus, and stream stabilization and native buffer planting were implemented. (These BMPs will be entered into the GRTS database).

Assessment of the aquatic ecosystem indicated a healthy benthic community has re-established itself in the stream. Streambank stabilization features banks that were sloped back to a stable angle of repose and planted to deep rooted native prairie. The stream corridor has experienced a number of flashy flows and has successfully controlled stream bank erosion.

**GOAL: To reduce NPS impacts from on-site wastewater treatment systems**

Improving private on-site wastewater systems is an essential step in improving water quality in Iowa. It is estimated that Iowa currently has up to 300,000 private septic systems and as many as one-third of those may be inadequate in terms of treatment effectiveness.

The Onsite Wastewater Training Center of Iowa operates at the Des Moines Area Community College and provides training to county sanitarians, onsite installers, engineers and others in the onsite wastewater industry. The Training Center is a member of the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT). The training center was developed with the assistance of a Section 319 grant for technical assistance and training. The center has been in operation since 2005 and has given 78 classes to more than 2500 participants since its inception. In 2011, eleven classes were conducted in all parts of the state with topics pertinent to that area. The Training Center continues to provide quality education to sanitarians to improve the quality of septic systems used in Iowa. The Training Center also provides training for certified time of transfer inspectors. Additional information can be found at www.wastewatertraining.com.

Iowa law includes a statewide requirement for time of sale septic system inspections. Every building with a septic system must have that system inspected prior to the transfer of the deed for that property. The time of sale is the most advantageous time to inspect and upgrade systems since money is already changing hands for the sale of the property. The inspection is primarily a method to discover the estimated 100,000 inadequate septic systems in Iowa. When an inadequate system is discovered during inspection it is

required to be repaired or replaced. The inspections are conducted by a state certified inspector to ensure consistency and the results of these inspections are provided to the county environmental health offices for any required follow-up. Since the program began, an estimated 12,000 inspections have been conducted and 4000 inadequate systems have been replaced with new code compliant systems. In FFY2011, approximately 900 "time-of'transfer" septic inspections were conducted statewide, and an estimated 450 inadequate systems were replaced with new code compliant systems. Additional information can be found at; http://www.iowadnr.gov/InsideDNR/RegulatoryWater/PrivateSepticSystems/TimeofTransfer.aspx .

Iowa's septic system regulations were updated in 2009 to include the previously mentioned time of sale inspection and to address improvements and innovations in the onsite industry. Iowa Administrative Code (IAC) 567 – Chapter 69, "Private Sewage Disposal Systems" now includes new technologies such as textile and peat filters to provide more options to properly treat wastewater on restrictive lots. Septic tank lids must be brought to the surface and effluent screens are now required to promote management of onsite systems. Many other changes were made to enhance system management and performance. Additional information can be found at: http://www.legis.state.ia.us/aspx/ACODOCS/DOCS/567.69.pdf .

The State Revolving Loan Fund (Onsite Wastewater Assistance Program) supports the replacement or upgrade of outdated private septic systems and has distributed more than 1,150 loans for a total of over $8 million. The program provides low interest loans for homeowners to update inadequate septic systems. Additional information about this program can be found at: http://www.iowasrf.com/program/other_water_quality_programs/onsite_waste_water_assistance_program.cfm

Several individual watershed projects address onsite wastewater treatment systems through various methods, including providing vouchers for septic tank pumping, providing educational workshops on septic systems, and by identifying unpermitted septic system discharges. More information about watershed projects that addressed onsite wastewater systems may found in the GRTS database.

Section 319-funded watershed projects that in FFY2011 included activities to address onsite wastewater treatment systems to improve water quality included:

- Mink Creek Watershed Project
- Brushy Creek Lake Water Quality Project
- Silver Lake (Dickinson) Watershed Project
- Price Creek Watershed Project
- Union Grove Lake Watershed Project
- Clear Lake Enhancement and Restoration Project
- Iowa Great Lakes Project

**GOAL: To protect waters of the State through installation and/or establishment of buffers and other riparian area improvements and through restoration and enhancement of wetlands**

Past projects have specifically promoted the installation or establishment of buffers or wetlands. During the FFY2011, wetland and riparian buffers practices were promoted and implemented through several individual watershed projects. In FFY2011, the number of wetland acres installed through watershed projects included approximately 299 acres. These wetlands resulted in sediment load reductions of 628 tons per year, phosphorus load reductions of 754 lbs per year, and nitrogen load reductions of 1,256 lbs per year. The number of buffers installed through watershed projects in FFY2011 included 17 buffer strips. These resulted in sediment load reductions of 322 tons per year, phosphorus load reductions of 419 lbs per year, and nitrogen load reductions of 7,627 lbs per year. More information may be found in the GRTS database.

Individual watershed projects which promoted the installation of buffers and/or wetlands in FFY2011 included:

- Clear Lake Enhancement and Restoration Project
- Rathbun Lake Special Project
- Muchakinock Creek Watershed Project
- Clear Creek Water Quality Project
- Union Grove Lake Nonpoint Source Watershed Project
- Prairie Rose Lake Water Quality Project
- Dry Run Creek
- Water Quality in Rathbun Lake: BMPs for Targeted Sub-Watersheds 2008
- Tete Des Morts Watershed Project
- Silver Lake (Dickinson)
- Big Creek Lake
- Kiowa Marsh Restoration Project
- Wetland Restoration Mini Grants
- Lyons Creek
- Black Hawk Lake
- Price Creek
- Lake Hendricks Watershed Project

**GOAL: To ensure 85% of the Iowa citizens are served by water systems with source water protection (SWP) programs and to achieve implementation of SWP plans for Public Water Supplies that will ensure 85% of the Iowa citizens are served by water systems protected by a SWP plan**

The Iowa Department of Natural Resources (DNR) Source Water Protection (SWP) Program incorporated the EPA Watershed Based Approach (WSBA) in late 2007-2008. The approach is basically: identify the problem, identify the source of the problem, and implement practices to decrease the risk to drinking water sources. This approach is incorporated into a living document called a “Source Water Protection Plan”. This new

approach was initiated in an effort to develop SWP plans that Iowa communities can implement to decrease risk to their source water. A review of past contractor-developed SWP plans exhibited few of the 200-plus contracted plans were readily accessible to the communities, and those that were accessible did not provide information regarding the contaminant risks or practices that would address risks to Iowa communities' source water. Therefore, these previous SWP plans yielded little positive impacts for the communities for which SWP plans were developed.

For many reasons it was strongly felt that a revised approach was needed for the DNR SWP program. The EPA WSBA includes adequate groundwater site investigations by the DNR Contaminated Sites Section that can identify existing SWP risks, the source of those risks, and potential practices (aided by the SWP Planning Team) that can best address those risks for highly susceptible Community Water Supplies (CWSs). Because the SWP resources were/are limited, the program needed to set priorities in order to best serve Iowa CWSs. A departmental SWP technical committee was developed in 2006. The members include DNR staff from Water Supply Engineering, Water Supply Operations, Water Monitoring, Watershed Improvement, Geological Survey, Environmental Services Division-Field Services, Contaminated Sites and Leaking Underground Storage Tank sections. The SWP technical committee set nitrates as the primary SWP criteria as it has a Maximum Contaminant Level (MCL) and there are land use practices that can be implemented to decrease this risk. In 2006 the program utilized DNR state water monitoring data to prioritize CWSs who are most susceptible to point and nonpoint source contamination from land use practices. Of the nearly 900 CWSs in Iowa, 228 of these met the SWP technical committee's criteria. A "top 40" list was then derived from the list of 228.

The SWP Technical Committee developed SWP Planning Criteria to assist communities in the SWP planning process. The criteria incorporate the WSBA by including direction for forming a locally led SWP Community Planning Team, conducting SWP Assessments, identifying source water problems and their sources. In addition, partnering with local, state, and federal agencies to identify Best Management Practices (BMPs) to address the identified problems is included.

The SWP Program developed a database in-house in early 2007 to support the SWP program. The database was not a cost to the SWP Program other than the SWP Program staff's time. The database is utilized by the SWP program, DNR staff, USDA-NRCS, Farm Services Agency (FSA), IDALS DSC, CWSs, consultants, Iowa Rural Water Association, Iowa Association of Municipal Utilities, local citizens, and local SWCDs, among others. The database, called the Source Water Tracker, provides information regarding CWSs well logs, SWP Reports, SWP Plans, Sanitary Surveys, and other data, and is available online at the following website:
https://programs.iowadnr.gov/sourcewater/

In 2008 the SWP Program initiated five SWP Pilot Projects that incorporated the WSBA. The five pilots were selected from the "top 40" priority list. The pilot projects organized SWP community planning teams, conducted ground water assessments and developed

SWP work plans. The project plans include practices for reducing risk to the water supply. These pilot projects were initiated by the DNR SWP program and in 2008 included the following agency partners: USDA- NRCS (both state and local office), USDA-FSA (both state and local office), USDA-ARS (Ames), USDA- Resource Conservation and Development, IDALS DSC, local SWCDs, DNR Contaminated Sites Section (CSS), DNR Water Supply (WS) Sections, DNR Geological and Water Survey Bureau, DNR Water Monitoring (WM) Section, DNR Field Services, DNR Leaking Underground Storage Tanks (LUST) Section, DNR Private Lands Biologist, and Watershed Improvement (WIS) Section.

The Pilot Projects identified the following CWSs needs: basic SWP outreach and information regarding defining SWP, how SWP affects the sustainability of a CWS and SWP capture zone description. In addition, explanation of the following health concerns: nitrates, bacteria and benzene in drinking water groundwater sources. In addition, a viable SWP ground water assessment is needed to identify the source of contaminants to determine BMPs for protecting CWSs in highly susceptible communities. Within the one year period the pilot projects were conducted, the following positive impacts were made:

- High Priority CWSs became actively involved in their SWP planning
- Applications/requests from CWSs for Drinking Water State Revolving Fund (DWSRF) loans for land purchase of "critical" land identified by SWP ground water assessment increased
- ISU Leopold Center for Sustainable Agriculture grant application for a CWS that will result in a 3 year study for changing land use to decrease risk to the CWSs – Leopold Center increased the funding from 3 to 5 years. In the 2 additional years the SWP Team will identify the economic benefit to the CWS for the farmer to change traditional land use to decrease N risk near or in the public wells.
- CRP enrollment in pilot project area
- Application for state WIRB grant for protecting critical source water areas
- SWP Team working with AG to include wetland restoration in the source water area
- USDA-NRCS actively involved in developing land use practices for identified priority areas
- USDA-FSA actively involved in accessing SWP DB to assist land owners in SWP-CRP eligibility
- Communities attending the stakeholder meeting in the Wallace building to support the 2008 SWP Criteria, many from both sides of the state as well as the Des Moines area
- CWS is utilizing the SWP ground water site investigation in applying for state WIRB Grant as well as state Watershed Development Grants
- Iowa was selected by EPA to receive, in 2009, SWP Outreach Workshop grant
- Iowa SWP for Targeted CWS received a second grant for conducted a SWP conference at the Iowa Water Conference held at Iowa State University in 2010
- The SWP Targeted CWS Program held a workshop for our CWS and AG partners in 2011.

- The Targeted CWS Program partnered with USDA-FSA to develop a CRP-WHP brochure for landowners/agency staff
- The Targeted CWS Program partnered with the Iowa Dept. of Public Health to develop eight FACT sheets regarding SWP/Public Health. These FACT sheets are distributed to USDA, DPH, and all SWP Targeted CWS Program Projects as well as available on the DNR SWP Website
- A SWP Technical Assessment Team (TAT) was organized in 2011 to provide technical contaminant source site investigation advice for each Targeted CWS project.
- A Source Water Advisory Board was developed in 2011.

Groundwater site investigations in the SWP pilot projects are critical to identifying the areas that are most susceptible to contamination in addition to identifying for planning purposes the source of the existing source of contamination. A surprising addition to approaching SWP in this manner is the proactive response from the CWS where the investigation is conducted and their deployment of action to develop and implement a SWP plan. The CWS's SWP Team does not actively get on-board until the ground water site investigation is conducted by DNR Contaminated Sites Section. As a result of a viable groundwater site investigation, these CWSs are now willing to provide their time, energy and funding to protect the area that is now more clearly defined by the investigation as a point source or nonpoint source contamination. In addition, pilot projects have expressed gratitude to the DNR SWP program for assisting them with decreasing risk to their CWS as well as providing information to assist in receiving grants to decrease risk through implementation of a viable SWP Plan.

Individual watershed projects which include source water protection planning and/or implementation include:

- Iowa Great Lakes Assessment Project (Region 7 EPA-funded SWP Plan, 2006)
- Honey Creek Watershed, Manchester, IA (IDALS Watershed Development Grant, 12/2011)
- Dry Run Watershed, Manchester, IA (IDALS Watershed Development Grant, 12/2011)
- Coe Creek Watershed, Elliott, IA (WIRB Grant, 12/2011)

In July of 2011 the DNR Source Water Protection Program experienced a program change. Due to the nature of the differences in Iowa CWSs, a need to address the most "at-risk" CWS and provide more rigorous assistance in technical and SWP planning to these high risk public water supplies was evident. Therefore, the Iowa SWP Program is now described as the following two programs:

**DNR Source Water Protection Program(s)**

**The SWP Program for Targeted CWS**:

- Is housed in the Contaminated Sites Section of the Land Quality Bureau of the Iowa DNR and is coordinated by Rebecca Ohrtman

(Rebecca.Ohrtman@dnr.iowa.gov) Phone # 515-281-0932. The SWP Program for Targeted CWS works with communities who are in need of addressing an ***existing*** contaminant problem as well as preventing additional risks in their drinking water supply. The SWP Program for Targeted CWS conducts a groundwater (gw) site investigation to assist the SWP community planning team in planning and practice implementation in order to decrease the contaminant risk to the water supply. The gw site investigation is conducted by the Contaminated Sites section technical assistance staff who work with both point source and non-point source concerns. The SWP Program for Targeted CWS follows the American Waterworks Association Guidelines For SWP Planning and Implementation.

**The SWP Program for Non-Targeted CWS:**

- Is housed in the Iowa Geological and Water Survey and is coordinated by Chad Fields (Chad.Fields@dnr.iowa.gov) Phone # 319-335-2083. The SWP Program for Non-Targeted CWS provides initial Source Water Assessments for all CWS in Iowa. The Non-Targeted Program also works with communities that decide to proactively protect their drinking water source, either independently or with the assistance of a contractor.

As of the end of FFY2011, the following table shows the percentage and number of PWSs that have achieved "substantial implementation" of their Source Water Protection Plans in Iowa:

**Number/Population of Community Water Systems reported achieving Substantial Implementation:**

Primary Community Water Systems: 66/909 (7%)
Community Population: 310,090/3,213,127 (10%)

**Agriculture Drainage Well Update**

Agricultural Drainage Wells (ADWs) were installed by farmers from the early to mid-1900's to drain agricultural lands to improve their farmability. ADWs were placed in locations where bedrock was shallow and where the distance to a gravity outlet was considered at the time to be too costly. ADWs provide a direct conduit to groundwater and are therefore a potential source of pollution and contaminants. The 1987 Iowa Groundwater Protection Act required that every ADW in the state be registered with the DNR and that research and demonstrations be performed by IDALS. The research began in 1989 at the ISU research farm outside Gilmore City by Iowa State University in conjunction with IDALS to investigate both closing the wells and continued use of the wells. The research determined that if the well head is protected and all the surface intakes connected to tile flowing into ADWs are removed that the potential for pollution or contamination into the groundwater is greatly reduced. Engineering studies were also completed to provide a rough cost-estimate to close and provide alternative drainage for all the reported ADWs in Iowa with a summary report completed in 1999.

A total of two-hundred and ninety-six (296) ADWs were registered with DNR. Some of these wells were closed by the applicants right away using IDALS cost-share money, some were determined to be non-functioning, and some were determined to be natural sinks. A total of 186 continued use permits were issued by the DNR in 1999 and 2000 for a length of 10-years. The permits required that three conditions be met: (1) the well-head had to be protected, (2) all connected surface intakes had to be removed, and (3) the disconnection of any septic systems tied to drainage tile that discharged into ADWs. Permits were recently renewed by the IDNR for another 10 years for wells that have not been closed.

Legislation passed in 1997 for FY98 provided the first appropriated money to cost-share closing ADWs and provide alternative drainage. The first project was completed in Pocahontas County in the area of the research farm. A total of 37 ADWs were closed with a cost-share amount of $1.5 million. IDALS has received appropriations for ADW closure almost every year since. Since its inception, this program has used $10.09 million as cost share to close one-hundred thirty-four (134) ADWs and provide alternative drainage. A small portion of the funding was used to pay for research completed by Iowa State University to look at other alternatives to closure where shallow limestone is present. The remaining money has been obligated to two projects that plan to close an additional nineteen (19) ADWs.

This voluntary program provides cost share money of up to seventy-five percent (75%) of eligible costs. Applications were sought by IDALS a number of times through mailing out information and application forms to every owner and user of ADWs as provided on the IDNR permits. Priority has been and continues to be closure of ADWs that pose the most significant risk to the environment and then based upon cost-effectiveness (i.e. the cost per well). Project selections have been made using the criteria above accounting for all the unfunded applications received and the amount of money available.

**Current Status of ADWs**

As of the end of FFY2011, a total of sixty-five (65) known wells remain to be closed. A summary of the status each of the wells remaining to be closed is provided below.

Ten (10) ADWs in Pocahontas County are planned to be closed, but only a portion of the cost-share funding has been committed at this time since the overall estimated cost increased with completion of the more detailed engineering study. This project is currently $0.53 million short of what is needed. The final design is complete and this project is ready for bidding if additional cost share money was available.

Nine (9) ADWs in Humboldt County have a final design report that is to be completed this month. This project is estimated to have a shortfall of $0.7 million for cost share based on the remaining available funds. This project would be ready for construction in 2012 if the additional cost share was available.

A more detailed engineering report is underway for twelve (12) ADWs in Humboldt County. The estimated cost-share need for this project is $1.95 million. At this time, no

cost-share money is available to commit to this project. This project could be ready for construction in 2012 if cost share money was available.

The remaining thirty-four (34) ADWs have no known plans for closure or detailed engineering work being completed at this time. The estimated cost share need to close 18 of the remaining ADWs totals $5.07 million. The other ADWs are located in areas with shallow limestone or sinkholes. If the solution to these ADWs is closure and alternative drainage over other management practices, the environmental benefit would be reduced because the surface water would still have a direct conduit into the groundwater through sinkholes. The study completed by Iowa State University in 2010 investigated alternative management practices other than providing tile drainage for the closed ADWs to allow for row cropping as the current land use. The results of this study need further development.

## APPENDIX A

Successful watershed project completed in 2011

## Brushy Creek Water Quality Project

**TOTAL SECTION 319 FUNDING EXPENDED:**

| | |
|---|---|
| • Salary & Benefits: | $134,307.99 |
| • Sediment Control Basin (Private Land): | $613.50 |
| • Miller Marsh Wetland Creation: | $15,500.00 |
| • DNR Grade Stabilization Structures: 3 completed | $10,552.30 |
| • DNR Sediment Control Basins: 13 completed | $48,464.00 |
| • **Total Section 319 Fund Expenditures:** | **$209,437.79** |

**MATCHING FUNDS:** **$2,429,659.24**

| | |
|---|---|
| • Miller Marsh Project | |
| ➢ Iowa Department of Transportation: | $509,629.00 |
| ➢ Webster County Conservation Board: | $60,657.09 |
| ➢ Webster County Pheasants Forever: | $40,000.00 |
| ➢ Pocahontas County Pheasants Forever: | $3,000.00 |
| ➢ Iowa Department of Ag & Land Stewardship: | $14,685.73 |
| ➢ Ducks Unlimited: | $10,000.00 |
| ➢ Whitetails Unlimited: | $2,500.00 |
| ➢ Conservation Reserve Program/Crop Sales: | $27,124.69 |
| • Sediment Control/Grade Stabilization Structures | |
| ➢ Public Owned Lakes Funds: | $12,500.63 |
| ➢ Iowa DNR Lakes Restoration Program: | $16,154.50 |
| • Grassed Waterways | |
| ➢ Public Owned Lakes Funds: | $1,800.00 |
| ➢ Iowa Department of Ag & Land Stewardship Watershed Protection Fund: | $764.25 |
| • Environmental Quality Incentives Program | |
| ➢ Strip Tillage/Nutrient & Pest Management: | $66,697.35 |
| • Conservation Reserve Program | |
| ➢ Value of All Contracts Enrolled: | $1,631,877.00 |
| • Salary & Benefits | |
| ➢ Iowa Department of Ag & Land Stewardship Water Protection Fund: | $32,269.00 |
| **Total Matching Funds:** | **$2,429,659.24** |

**TOTAL EXPENDITURES FOR LIFE OF PROJECT: $2,647,827.06**

**Executive Summary**

The Brushy Creek Lake Water Quality Project began on July 28, 2005, with the objective of protecting the water quality of the recently constructed lake and concluded on June 30, 2011. The project provided some unique challenges faced on the flat and intensively farmed landscape of the Des Moines Lobe in north central Iowa. The vast systems of pattern tile and the drainage ditch networks that cover the watershed increase the potential and speed of which contaminants, such as nitrates, phosphates, and sediments, can reach the lake thus degrading the water quality. Efforts were made throughout the five year project to address as many of these concerns as possible.

The goals of the project were focused mainly around implementing Best Management Practices (BMP's) through the Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), the use of Section 319 program dollars, and other matching funds that could be tied into the project. In total there were funds and technical support used from 17 different sources/partners to implement conservation practices in the watershed. Some goals were either not met or were determined to be not feasible after the project began and further on the ground assessments could be made by the project coordinator and other technical experts. The reasoning behind this is explained further in Part 3 of this document.

Efforts were made to reach and exceed as many of the original goals of the project as possible and along the way many of these were successful. The enrollment of new CRP filter strip acres combined high level of re-enrollment for expiring filter strip contracts has 87% of the eligible acres in place throughout the watershed. In addition the number of restored wetlands through the CRP exceeded the project goal and is playing an important part in filtering the water before it enters the tile systems and is delivered to the lake. There were also other CRP practices introduced that expanded the opportunities to enroll acres that were not eligible when the project started. This allowed the project coordinator to reach out to more producers and present them with conservation ideas that helped to address their resource concerns and to improve the effectiveness and profitability of their operations.

The EQIP practices that were implemented played an important and effective role in protecting the lake. Nutrient Management, Pest Management, and Strip Tillage enrolled through the program impacted many acres primarily in the southern portions of the watershed. Enrollment into this program was highest during the first and last years of the project. Much of this can be attributed to the change in priority practices through the EQIP and the amount of available funding to support these practices. The success in the final year of the project was focused around strip tillage and is a direct result of "Operation Strip Till" that was started by a locally led group who wanted to introduce this practice to the local landowners. The benefits of this program are being seen across Webster County and interest is growing in strip tillage as more and more producers see the environmental and economic benefits of this practice. It is anticipated that more acres will be converted to this form of tillage in the near future within the Brushy Creek Lake Watershed.

There were also efforts made by the project coordinator to explore all other opportunities that were not goals originally set for the project, but that had the potential to significantly impact the preservation of the lake. The most important and significant of these opportunities was the expansion and full restoration of the Miller Marsh Wildlife Area at the northern end of the watershed. This now 185 acre permanent conservation area is working to filter surface runoff

from the northern most 800 acres of the watershed and is positively impacting water quality downstream. In addition plans are currently underway to expand and restore the marsh in the future. The lasting impact that this area will have on water quality will play an important part in the preservation of Brushy Creek Lake.

In total the conservation practices implemented during the six year project provided a sediment loading reduction of 2,237 tons per year.

**Introduction**

The Brushy Creek State Recreation Area has been a popular place for recreational activities for many years and only increased in usage with the construction of the lake in 1998. The lake and surrounding 6,500 acre park provide many recreational opportunities for park visitors, including camping, horseback riding, swimming, fishing, hunting, and over 45 miles of trails. Data provided by the Iowa Lakes Valuation Project showed that between 2002 and 2005 the park seen an average of just under 145,000 visitors annually that generated over $8 million. In addition the data showed that approximately 160 jobs were supported as a result that provided over $2 million dollars on labor income during that same time period. The peak number of visitors during this time frame reached nearly 200,000 in 2004 and was more than double the statewide average.

The 690 acre Brushy Creek Lake is situated in the east central portion of Webster County between the cities of Webster City and Fort Dodge and is a tributary to the Des Moines River. Construction of the lake was completed in 1998 and it quickly became known for its fishing by both local and out of state anglers. Brushy Creek Lake is not currently, nor has it been, on the State of Iowa's 303d list as an impaired waterbody. According to "Iowa's Final 2008 Integrated Report" the lake is listed in Category 3b which means that there is insufficient data that exists to determine whether any designated uses are met, but at least one use is potentially impaired. The lake is listed on the Iowa Department of Natural Resources (IDNR) 305b assessment for Class A (primary body contact) and Class B(LW) (aquatic life of lakes and wetlands) according to 2004 assessment that determined both uses to be "fully supporting". Brushy Creek is also one of the IDNR's Lakes Restoration Programs priority lakes.

The watershed area for the lake is 56,917 acres, which creates a watershed to lake ratio of 82 to 1 (HUC 8: 07100004). The southern part of the watershed, in which the Brushy Creek State Recreation Area is located, consists of small fields, timber, and brushy ravines close to the creek. This area has some relatively sharp topographic changes and is where the majority of the Highly Erodible Land (HEL) occurs in the watershed. The remaining 98% of the watershed is relatively flat and is considered Non-Highly Erodible Land (NHEL) from the Webster-Clarion-Nicollet soil association. This makes it nearly impossible to enforce compliance issues that are focused on by the farm programs payments. Only the producers who have chosen to participate in conservation programs, such as CRP and EQIP, are actively following a signed conservation plan.

The reduction of nitrate, phosphorus, and sediment delivery to the lake was the main focus of the project because it is these three contaminants that pose the greatest threat to the overall water quality of Brushy Creek Lake. As a result of the Brushy Creek Watershed Development grant efforts, both sheet/rill erosion and land cover/use maps were developed in 2004 that estimated a total of 1,585 tons of sediment was being delivered to the lake annually from the watershed. A land cover map developed at the same time showed the watershed to be at about 86% row crop agricultural production with this generally being a corn/soybean rotation. Sediment loss and

delivery estimates were completed again in 2006 and 2008 by the project coordinator. The results of these surveys showed sediment delivery rates of 1,577 tons and 1,353 tons per year respectively. It is important to note that these figures do not reflect the estimated 550 tons of sediment being delivered to the lake by gully erosion annually. The 2008 land use assessment of the watershed found 82% of the land in row crop production with the majority of the land still in a corn/soybean rotation, but it was noted that there was a general trend towards more of a corn/corn/soybean rotation by some of the larger producers in the watershed. This can be attributed to higher corn prices and the need for additional corn production to support the ethanol industry in the area. Other uses included CRP land, public lands, the towns of Vincent and Duncombe, rural acreages, and several other uses. Given the flatness of the landscape, agricultural production, and the extensive network of artificial drainage systems, the time of delivery of contaminants to the lake is greatly increased.

## Project Goals, Objectives, & Activities

### A.) Planned & Actual Milestones, Products & Completion Dates

There was a broad range of goals set for the project, some of which were met and others that were not reached for various reasons (See Table 1). In total there was a sediment loading reduction to the lake of 2,240 tons per year. A breakdown of sediment delivery reduction by year and installed practice can be seen in "Table 2". The paragraphs below are an explanation of why some of the goals were achieved during the life of the project.

As of June 30, 2011, there were 8 grade stabilization structures and 17 water and sediment control basins constructed that are stopping an estimated total of 626 tons per year of sediment from reaching the lake. The number of both practices installed exceeded the project goals. During the first two years of the project, priority was given to the active gullies that were identified as the most erosive by the local IDNR staff and the approach of constructing one or two structures per year was taken. This system worked well with the available funding; however, it became apparent that this approach would not work to address the many active gullies in need of attention around the lake and that a different approach would need to be taken in order to provide the maximum water quality impact. It was during the fall of 2007 that all of the gullies around Brushy Creek Lake were assessed and a plan was put in place to address those that were most erosive based upon estimated soil loss. As a result of this action an additional grade stabilization structure and 13 water and sediment control basins were designed and constructed. In addition there are four other sites that are in further need of archeological investigations before any construction could take place. These additional sites have a potential sediment loading reduction of an estimated 125 tons per year.

Other practice goals were only partially met mainly due to a lack of interest by producers or by a lack of available program funding. These include the nutrient and pest management practices that were planned based largely on the availability of EQIP funds. Plans were written for 1,527.6 acres of nutrient management and 588.4 acres of pest management during the life of the project. Some of the nutrient management acres were implemented as a result of a CNMP that was written one of the swine operations located in the watershed. The priorities for the EQIP have changed and even though the Brushy Creek Lake Watershed has remained a priority area it has become increasingly harder to get these two particular practices funded.

Grassed waterways were another practice that did not receive much interest from the producers in the watershed. During the project at total of 2.9 acres of new grassed waterways and one re-enrolled area were installed using CRP, Public Owned Lakes (POL) funds, and Watershed

Protection Funds (WSPF). The 18 acre goal was set quite high with this number based on general observations of need during the development grant phase of the project and no solid producer commitments. It is possible that there are this many acres to be found in the watershed, but opportunities were narrowed given the flatness of the terrain above the lake and producer commitment.

The 18,000 acres of whole farm planning was as a goal that was set with no real idea of where exactly these acres would come from or what they would be planned for. During the life of the project conservation plans were written and signed on 12,633 acres (22% of watershed) for CRP, EQIP, Conservation Stewardship Program (CSP), conservation tillage/cropping rotations, and other practices. The lack of lands that are considered highly erodible in the watershed provides no enforcement of plans written for tillage/cropping operations and while the signed plans have conservation tillage/cropping rotations included these may or may not be followed by the producers. The planned practices were made based on observations during field visits prior to writing the plan for the producers.

A small amount of progress was made towards reaching the tree and shrub planting goal; however, many of the acreages in the watershed already have a sufficient windbreaks in place. There was 3.0 acres of windbreaks established during the life of the project.

The rest of the goals that had no progress made towards meeting them were determined to be infeasible or not needed in the watershed after the project was begun. There are only two large confinements in the watershed and they have sufficient animal waste facilities located on site. The other animals are scattered and generally consist of five to 15 animals and the actively pastured areas in the watershed are generally three acres or smaller in size and made the pasture management/rotational grazing practice infeasible to use.

The need for streambank stabilization is high in the areas directly above Brushy Creek Lake where the stream channel is meandering; however, much of this need is located on State of Iowa land. There are two sites that are privately owned and these sites were evaluated for soil loss and streambank erosion. The addition of 1,000 feet of streambank stabilization that was proposed in the grant would have had a minimal impact and didn't seem be the best use of project dollars. Ideas have been explored on one of these sites in an attempt to find alternate practices that were more feasible and would impact a greater area at a lower cost to the project and landowner. This information is discussed in Part 3, Section D of this report.

There was one additional practice that had goals set, but was unattainable. The 200 acres of forest stand improvement planned for areas within the Brushy Creek State Recreation Area is a practice that is needed and would have vastly improved some of the timber ground that is directly adjacent to the lake; however, due to staff shortages and budget shortfalls the need for labor could not be met and therefore this practice was not given consideration after the project started.

**Best Management Practices Developed and/or Revised**

Many BMP's were developed and implemented throughout the six year project. As was noted earlier, many of these practices had specific goals set when the project was started while others were discovered and developed based on need and feasibility.

**A.) Miller Marsh Wildlife Area**

The expansion and restoration of the now-185 acre Miller Marsh Wildlife Area at the northern

end of the watershed was one of the projects that came about in November of 2005 and is considered the centerpiece of the project. The original acquisition of Miller Marsh took place in 2003 when the Webster County Conservation Board (CCB) purchased and restored a 38.5 acre parcel of land through the Wetland Reserve Program (WRP). It had long been their goal to acquire ground in this part of the county to provide some much needed permanent wildlife habitat and after the restoration was completed they were looking for ways to acquire additional acres to expand on this small conservation area. The Webster County SWCD/NRCS staff was contacted in late 2005 by the Iowa Department of Transportation (DOT) about their need for wetland mitigation acres in Webster County as the expansion of U.S. Highway 20 was taking place. After discussing this with the Webster CCB a plan was put in place to contact the owners around Miller Marsh to determine interest in selling their land for this purpose. The project progressed and involved three different landowners with the completed acquisition of an additional 146.5 acres of land. The restoration included the replacement of nearly 4,000 feet of county main tile, shallow water excavation of 13 acres, construction of a 1,000 foot earthen dike, the closing of an ag drainage well, and seeding of the area to a mix of upland and aquatic plant species. The project worked to fully restore the wetlands in the original WRP site along with an additional 55 acres on the newly acquired portion of this area.

In total the project cost $683,097 and received funding/technical support from 10 different sources. They include the NRCS, Webster County SWCD, EPA Section 319 funds, Iowa DOT, Webster CCB, Webster County Pheasants Forever, Pocahontas County Pheasants Forever, Iowa Department of Ag & Land Stewardship-Division of Soil Conservation Ag Well Closure Funds, Ducks Unlimited, and Whitetails Unlimited. This project worked to create and solidify working relationships with these groups and agencies that will only work to further conservation progress in future projects.

The Miller Marsh project was also featured in several publications, including stories in the Fort Dodge Messenger on three different occasions, the Iowa NRCS "Current Developments" newsletter in the spring of 2007, IDNR's "Working For Clean Water" publication in 2007, and an article in the national Pheasants Forever magazine. All of these did a good job of noting the importance of Miller Marsh and how it would affect the water quality downstream in Brushy Creek Lake.

**B.) Sediment Control Structures**

The installation of Grade Stabilization Structures (GSS) and Water & Sediment Control Basins (WASCB) has played an important role in protecting the lake. As was noted in Part 3, the need to control active gullies around the lake was a goal of the grant application that was submitted to the IDNR. Based on conversations with the local park staff at Brushy Creek Lake during the development grant phase the need for six GSS and six WASCB'S was determined to slow down significant soil loss that was occurring. Eight GSS and 17 WASCB's were constructed during the five year project and they are stopping an estimated 626 tons of soil from reaching the lake on an annual basis. The project coordinator worked with the IDNR staff to have the trail system incorporated into eight of these structures which allowed the trail to be moved away from some of the more erosive soils that occur inside the timbered areas around Brushy Creek Lake.

**C.) Grassed Waterways**

There was construction completed on 2.9 acres of new grassed waterways and the re-enrollment of one at 0.8 acres during the five year project that provided for a sediment loading reduction of 28 tons per year. The need for this conservation practice is not significant in the watershed given the relatively flat landscape; however, there were areas that would have benefited greatly from this practice.

## Monitoring Results

The project coordinator began water testing in March of 2006 at seven designated locations in the Brushy Creek Watershed (See Attachment 1). These sites were chosen so that the watershed was broken up equally allowing data to be gathered as the water moved down the main tributary towards the lake. Two of these monitoring sites were established to take readings from the other tributaries to the lake that drain approximately 4,000 acres each. The testing started in the spring of 2006 shortly after the ditches became free of ice using IOWATER test strips and continued through the fall of 2006, focusing on nitrate and phosphorus levels. The data gathered was consistent with the general trend that would be expected in a watershed on the Des Moines lobe. The nitrates were higher in the spring as leaching from agricultural lands occurred and eventually went lower as the crops used up the fertilizer. The project coordinator felt that while the patterns were consistent the readings were not at the levels that would typically be expected because the IOWATER test strips are very open to interpretation by the user. Based on publications from Iowa State University about water quality testing, completed water tests by the Webster County SWCD that were analyzed by a laboratory, and the use of better water testing equipment it was determined that the typical nitrate range through the spring and early summer averages between 12 and 18 mg/L. Samples collected and sent to the Iowa Hygienic Laboratory for analysis in the fall of 2006 confirmed that the test strips were giving very inaccurate values. So, in the spring of 2007 the Webster County SWCD purchased a Hach Company water testing kit. This testing kit involved adding reagents to the water samples prior to testing them and did produce more accurate results. While the overall values were still showing lower levels than that of a couple of samples tested against a lab analysis a pattern did develop to show the Hach test kit was consistently 6 mg/L lower than the lab results. This allowed for a better baseline of data to be developed and the nitrate levels entering the lake could be more accurately reflected.

Phosphorus levels during this same time period were typical of a north central Iowa watershed. Low flow periods seen lower levels and during high flow when there was more sediment moving through the ditches and streams it was observed that the phosphorus levels spiked.
While the BMP's and other conservation practices installed and implemented during the project are working to reduce the nitrate and phosphorus loading into the lake there is still a significant threat being posed. Over application of fertilizers and excessive tillage are still occurring and these will continue to pose a threat to the lake in the years to come.

## Coordination Efforts

### A.) Coordination from Other State Agencies & State Environmental Program Coordination

The Iowa Department of Agriculture & Land Stewardship-Division of Soil Conservation was a key and effective partner in the success of the project. Their contribution of funds through Water Protection Funds (WPF), WSPF, and the agricultural well closure program were significant in the accomplishment of project goals.

The Iowa DOT proved to be a key partner in the successful implementation of Miller Marsh. Their technical and financial assistance of nearly $510,000 for land acquisition and seed made this site the largest BMP implemented during the project. This in turn made other local funds available for the full restoration of the site and the closure of the agricultural drainage well on site.

In addition, the Iowa DNR Lakes Restoration Program (LRP) provided $16,154.50 of cost share to cover 25% of the total cost to construct the final 14 structures at Brushy Creek. This contribution made the project possible and successful.

**B.) Federal Coordination**

One of the strongest partnerships developed throughout this project was that of the Webster County SWCD and the NRCS Field Office. Prior to and during the project the local staff worked with the Webster County SWCD and the project coordinator to gather data from the field using windshield surveys, field visits to identify conservation concerns, and by their general knowledge of the area from having worked and lived in this part of Webster County. They aided the project coordinator by providing technical support through survey and design of structures, implementing the federal conservation programs, and coordinating efforts with other local conservation groups and agencies. It is safe to say that if it were not for their willingness to take on tasks related to the Brushy Creek Lake Project efforts to protect the lake would not have been as successful.

**C.) USDA Programs**

The project was successful in using Federal Farm Programs dollars to install eight different types of conservation practices throughout the watershed. Three of these programs, the CRP, the EQIP, and the CSP, were used to accomplish this. Below is a description of how each of these programs was used to accomplish the project goals and objectives.

1.) **Conservation Reserve Program**

The many miles of dredge ditch and the flat landscape that is covered with countless potholes presented an opportunity to implement CRP practices throughout the watershed. New CRP signup was highest at the beginning of the project and seen a sharp decrease as the project progressed. The decline can be attributed to higher than average corn and soybean prices and the encouragement by many to grow more corn to support ethanol production. A reversal in this trend and mind set are being noticed as input costs have caught up to commodity prices and questions about ethanol production in the area are still unanswered.

During the five year project a total of 161 acres (60 wetland and 101 buffer acres) were enrolled into the CRP Farmable Wetlands Program (FWP). In total 23 wetlands were restored. As is the case with many of these FWP's they are temporary/seasonal wetlands and were only restored to the extent allowed by the program rules. With many of these areas this meant manipulating a surface intake or blocking/replacing small perforated tile with non-perforated lines. These wetlands, along with the associated upland buffers, are important in aiding to filter the water of nitrates and phosphorus before it enters the tile systems that carry these contaminants downstream. Sheet and rill erosion is the most common form of erosion in the watershed with the typical tons/acre/year of erosion being somewhere between 1 and 2 tons, so the sediment load reduction affect that these FWP's provided was somewhat minimal at an estimated 26 tons/year.

Although the enrollment of new acres of CRP filter strips was a modest total of 33.8 acres, the reenrollment of expiring CRP contracts was high at 309 acres. These figures increased the total eligible filter strips in enrolled in the watershed to 87%, which is well above the project goal of 75% establishment. Contacts were made to the remaining landowners who had not yet enrolled their land in the CRP, but these were met with resistance and an unwillingness to participate. Many of these landowners felt that they could make more money cropping the marginal areas along the dredge ditches rather than seeding them down. As is the case throughout most of north central Iowa many of these marginal areas have surface intakes or surface inlets that drain the areas closest to the stream with no filtering of the water prior to entering the water course. The

CRP areas that are in place are filtering the water adequately and provide an estimated sediment loading reduction of 1,354 tons annually.

Other CRP practices enrolled included windbreaks at 1.9 acres, grassed waterways at 2.2 acres, and upland wildlife habitat buffers at 10.1 acres. These practices provided a combined sediment loading reduction of 18.1 tons per year to Brushy Creek Lake.

The CRP proved to be a successful program in the Brushy Creek Lake watershed during the five year life of the project. In total there were 105 contracts signed for a total contract value of $1,631,877. There were other funds not accounted for in this report, including signup bonuses and payments for seeding/restoration, because these numbers would have to be gathered through the Farm Service Agency (FSA) records and would have been extremely time consuming. In addition to the new acres enrolled there were a significant number of acres signed up in the three years prior to the project that are having an important impact on the water quality and adding to the overall quality of the lake.

**2.) Environmental Quality Incentives Program**

The EQIP was another program that was successfully used to promote conservation in the watershed. The three practices that were applied using this program were Nutrient Management, Pest Management, and Strip Tillage. The EQIP was most used in the years leading up to project, as well as the first and last years, to promote these practices on a whole farm scale. The commissioners of the Webster County SWCD realized the importance of Brushy Creek Lake both from a recreational and economical standpoint as they made the watershed a priority area thus allowing applications in this area to achieve higher ranking scores. The watershed has remained a priority area in the county, but changes to program rules and national level priorities moved the applications away from the nutrient and pest management practices in Webster County. One change that has kept some farmers from attempting to qualify for this program is the cap on the number of acres that can be enrolled by one producer at 320. The feeling amongst the producers is that they would like to sign up and be paid for their entire operation. The applications that were approved in the final year of the project were all based around strip tillage.

**3.) Conservation Stewardship Program**

The CSP was a program that was introduced to the watershed in the final two years of the project. As the program administrators moved away from a selected watershed based approach to a continuous signup for all agricultural lands this presented an opportunity for landowners and producers in the Brushy Creek Lake Watershed to take advantage of another federal program that focuses on rewarding them for their good land stewardship practices. There were eight producers that applied for and were accepted into the CSP on a total of 2,222 acres. Five of these producers incorporated strip tillage into their operations while another managed an organic pasture area used to produce hay for livestock production. For many producers only small changes were needed in their operation to qualify for this program and as word has spread about the advantages of this program the interest has grown in the watershed. It is anticipated that more and more producers will attempt to take advantage of this program as new funding periods are announced. This program does present the opportunity to affect many aspects of the farming operations currently in place throughout the watershed, including the amount of tillage that is being done, nutrient placement and timing of application, and the number/amount of BMP's on the ground that will all have a lasting effect on Brushy Creek Lake.

**<u>Summary of Public Participation & Outreach Activities</u>**

Public participation and support varied during the project. There were a number of outreach

methods used in an attempt to involve as many landowners, producers, and interested individuals as possible in the project.

In an initial attempt to pull individuals from the watershed into the project a public meeting was held in September of 2005. Prior to the meeting a news release was placed in the Fort Dodge Messenger that introduced the project and the planned meeting. This release was estimated reach approximately 15,000 households in Webster County and the surrounding areas. There was also a letter sent each landowner/producer/resident of the watershed personally inviting them to the meeting. The September 19, 2005, meeting had 24 people in attendance and was a lower than anticipated turn out.

A Level 1 IOWATER workshop was sponsored by the Webster County SWCD in September of 2006, with the primary intent of this meeting being to introduce interested individuals to water quality issues and how they tie into projects, such as the one at Brushy Creek. A press release was put in the Fort Dodge Messenger prior to the meeting that reached an estimated 15,000 households and a mailing was sent that totaled 460 letters. These went to all of the landowners/producers/residents of the watershed, as well as the group participating in the Iowa State University Extension/Webster CCB sponsored Master Conservationist group. In addition, all of the local school districts received an e-mail about the workshop. There were 18 individuals who attended the workshop.

At the conclusion of the Miller Marsh Wildlife Area expansion and restoration project a field day was held to show the public what had been accomplished and was a chance to recognize local conservation groups and agencies who contributed time and funding to make the project a success. The day seen the attendance of just over 50 people and was covered by the Fort Dodge Messenger. The article reached the Messenger's circulation of approximately 15,000 people.

Other public outreach meetings included the kickoff event for "Operation Strip Till", which is a locally led project focused on educating producers and encouraging them to try strip tillage on their farms. This was an event co-sponsored by Iowa State University Extension, the Ann Smeltzer Charitable Trust, Webster CCB, Webster County SWCD and the Iowa Learning Farm. Although this meeting was held on a demonstration farm outside of the watershed it provided an excellent area for producers to see a variety of conservation practices that were installed and to see firsthand how effective they can be. Letters of invitation were sent to all producers in the Brushy Creek watershed. There were two subsequent meetings held in March of 2008 and September of 2009 to further promote this practice. These meetings were well attended and yielded interest in the program from producers in the watershed. Some signed up to have portions of their operations custom strip tilled so that they could evaluate and compare strip tillage to their current farming practices. Unfortunately the weather in the fall of 2008 and spring of 2009 prevented much of the custom strip tillage to be completed on the farms of those interested and some subsequently lost interest in the program; however, there were over 400 acres of land enrolled in the EQIP for strip tillage payments in fiscal year 2010. The foundation for change seems to have been put in place across the watershed and throughout Webster County. It is anticipated that more producers will take advantage of this practice in the years to come.

The project coordinator also gave a presentation on the Brushy Creek Water Quality Project during a "Habitat Workshop" that was sponsored by Iowa State University Extension in February of 2008. There were 46 people in attendance. The presentation focused on accomplishments and goals of the project, as well as the identified resource concerns in the area.

An additional outreach effort was made by the project coordinator at a conservation field days

that were held during every year of the project by the Naturalist for the Webster CCB. Topics discussed during these days included water quality, wildlife, stewardship, and how all three are important to the preservation of the environment. These days were attended by 5th and 6th graders who were from Fort Dodge. In total the project coordinator talked to and helped to further the environmental education of nearly 470 students.

Outreach efforts were also made through the use of newsletters, practice specific mailings, and personal follow up contacts. A newsletter was published along with the Webster County SWCD annual report in each year from 2007 to 2009 that highlighted activities in the Brushy Creek Watershed for that particular year. These newsletters were sent county wide and reached an estimated 2,500 households each of those years. The project coordinator also used mailings about program availability or producer eligibility followed by a phone call in an attempt to increase the number of conservation practices in the watershed. All of these techniques did work. In some cases it simply brought up questions about the project while in others it led to on the ground conservation practices.

**Part 8 - Aspects of the Project That Did Not Work Well**

One aspect of the project that did not work well was the coordination of archeological reviews required to complete the building of the structures around Brushy Creek Lake. Construction of the first 10 GSS & WASCB structures was completed without any complications or holdups. The NRCS State Archeologist completed the reviews in Des Moines using the historical data that had been collected and archived. The initial 10 structures had no known cultural resource sites in the work areas and staff was on site to oversee construction and watch for any problems that may have developed once the construction began. This process was working fine until a request was submitted in September of 2006 for the site that is recorded on the Administrative Spreadsheet as "DNR East Ramp". The request was sent back and the project was sent through a "Phase I Intensive Archeological Review", which was an understandable process since there was a known cultural resource site close to the proposed work area. The problem that was encountered was the time frame from which the request was made to review the site and when construction was completed. As was noted the request was made in late 2006 and it took until July of 2009 to approve and construct this simple 190 foot long WASCB.

The same problem was encountered with the slow archeological review process as the project coordinator moved forward with the last 14 structures that were constructed to address gully erosion concerns. The survey and design of these areas was completed in the fall of 2007 and spring of 2008. A "Phase I" archeological review was initiated by the IDNR Lakes Restoration Program staff in September of 2008 and it took until February of 2010 to receive the completed report. It was the goal and intention of the project coordinator to have these structures built in fiscal year 2010, but due to the hold ups with the archeological process this was not completed and would appear to reflect badly on the success of the overall project.

Although the construction of the final 14 sites did take place after the project was extended through fiscal year 2011, it is the feeling of the project coordinator that this issue needs to be discussed and a more streamlined, time specific process needs to be developed to ensure that projects can continue to move forward as scheduled. It is hard to accept the fact, and quite frankly is very frustrating, that the field office level work was completed in a very timely and efficient manner only to have the project held up for nearly three years by processes that are required to be completed outside of the local office. Every time that there is a delay, goals are not met and landowners and partners begin to become impatient.

**Future Activity Recommendations**

With the project now completed there are still projects that have been identified as needed to add to the overall success of the project, but have not been able to be completed for varying reasons.

There are a few gully erosion sites that the project coordinator would recommend for follow-up evaluations in the near future. The archeological review that included the final 14 structures that were built revealed that there were cultural resources within the work area of an area labeled "Site 7". It was recommended by the archeological reviewer that this site would not be included in the current phase of the project so that progress could continue without delay on the rest of the sites and to allow for more time to determine the extent of this archeological site. Also, a review of "Site 13 East" will also be required to determine a solution to this active gully. This site is located in the north equestrian campground and presents a challenge because of the size of the drainage area in relation to the amount of available storage. A grade stabilization structure would work on the site; however, its location in the campground and proximity to a playground area could present risks to the campers, especially children. A better alternative will need to be found before work proceeds on this site.

In addition to this site, there are two other structure locations on the west side of the lake that were identified by IDNR staff as very active erosion sites in need of treatment. The gullies extended onto a private farm and the landowner proved to be difficult to deal with. After much discussion the IDNR and the landowner completed a land swap that put these two gullies into public ownership. The construction of sediment control basins on these sites would provide an estimated sediment loading reduction of 77 tons per year. An area that is approximately 300 feet above these gullies has been seeded to native grasses and it is the recommendation of the project coordinator that these sites be monitored closely and action be taken to minimize their impact on the lake. It is highly recommended that these sites be reevaluated within the next 2 to 3 years to see if they are continuing to advance.

The remaining 35 gullies that were identified were determined to have little or no active gully erosion occurring at this time. This could change in the future as land uses are changed in the park. Many of these sites currently have the upland portion of the drainage area seeded to native prairie or hay/alfalfa; however, the fields are periodically rotated back into row crop production. If this was to happen it would be necessary for an evaluation of these sites again to determine the extent of erosion, if any, begins to occur. An evaluation of these sites is recommended every few years regardless of the land use to determine soil loss into the lake.

The Webster County SWCD and Webster CCB were contacted in January of 2010 about the Iowa DOT's need for additional mitigation acres in Webster County. An area on the northeast side of Miller Marsh will be focused on for purchase and development of these acres. The Webster County SWCD and NRCS will continue to work with the conservation partners in the area to further develop the Miller Marsh Wildlife Area.

# APPENDIX B

LIST OF AGENCY COOPERATORS

**State Lead Agency**

Iowa Department of Natural Resources
Allen Bonini, Supervisor, Watershed Improvement Section, 515/281-5107
Stephen Hopkins, Nonpoint Source Coordinator, 515/281-6402

**Other State Agencies**

Iowa Department of Agriculture and Land Stewardship/Division of Soil Conservation
Jim Gillespie, Director, 515/281-6146

**Federal Agencies**

U. S. Environmental Protection Agency, Region 7
Karen Flournoy, 913/551-7782

U. S. Department of Agriculture, Natural Resources Conservation Service
Rich Sims, State Conservationist, 515/284-6655

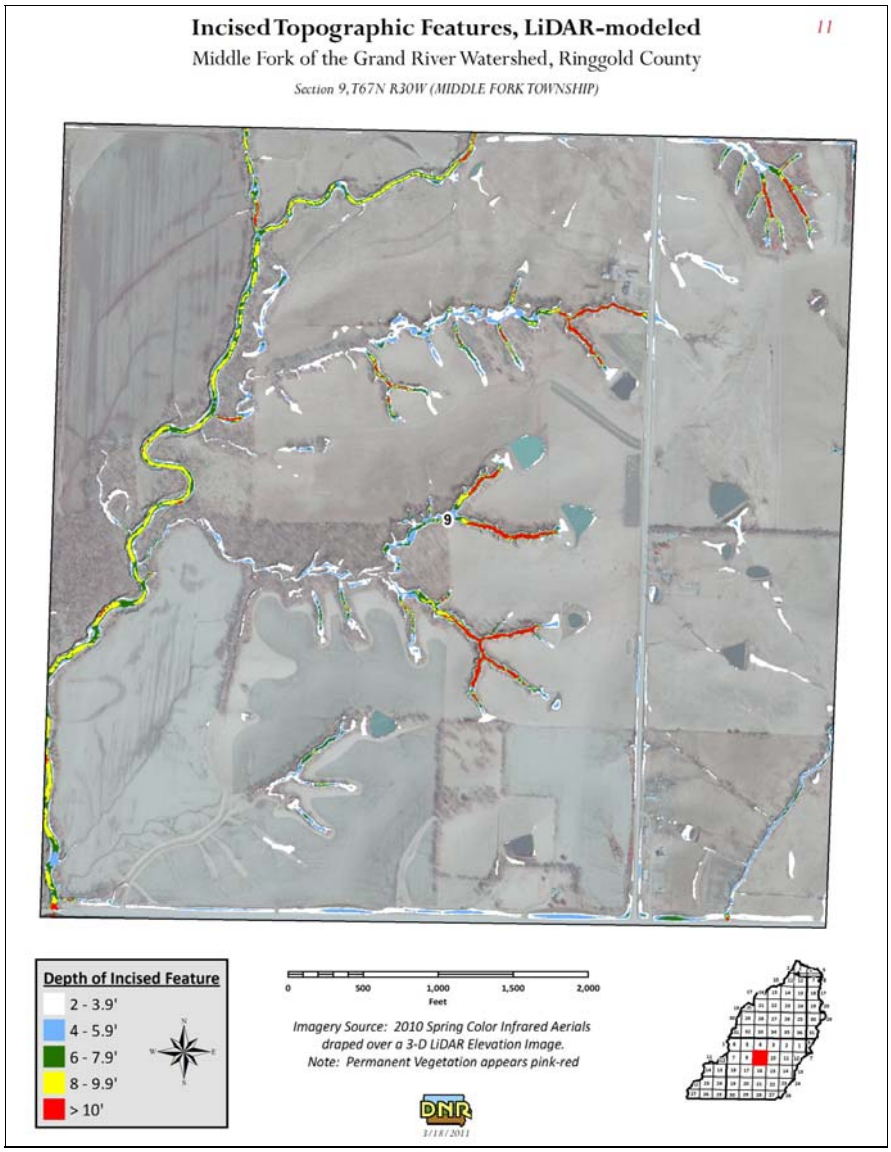
U. S. Department of Agriculture, Farm Services Agency
John Whitaker, State Executive Director, 515/254-1540

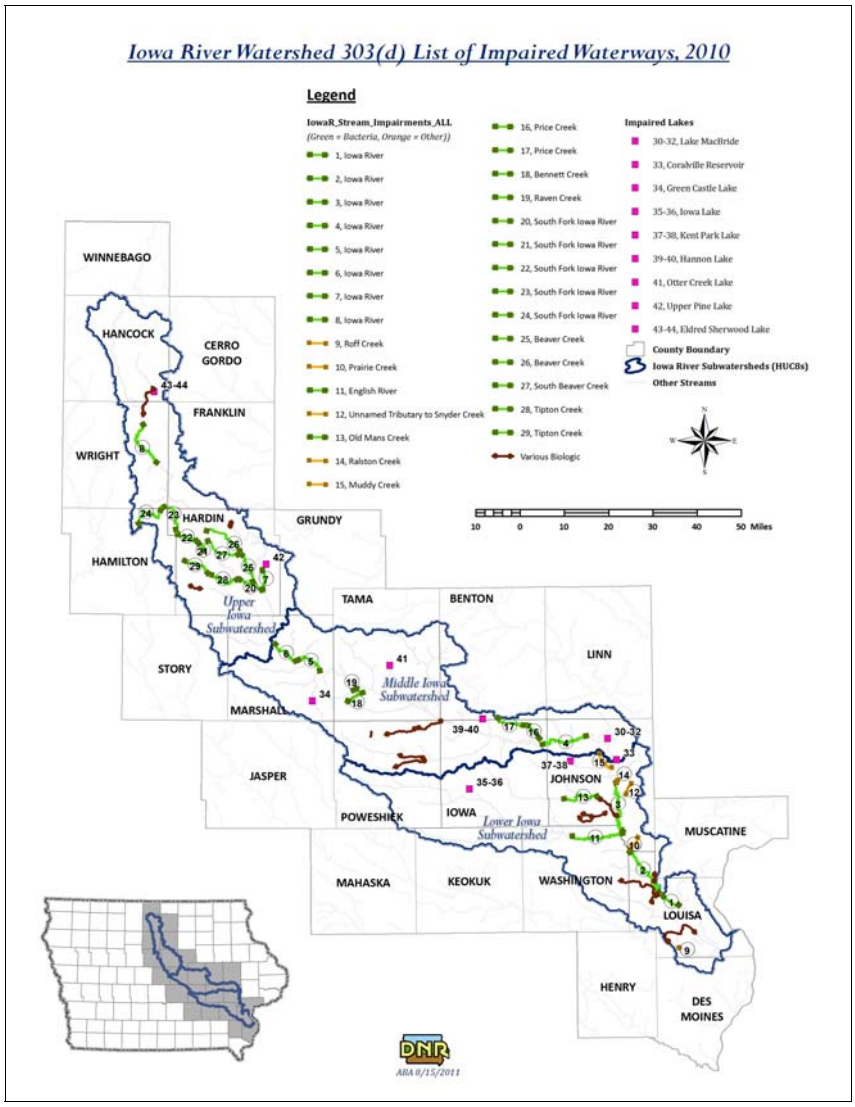
**Local Agencies**

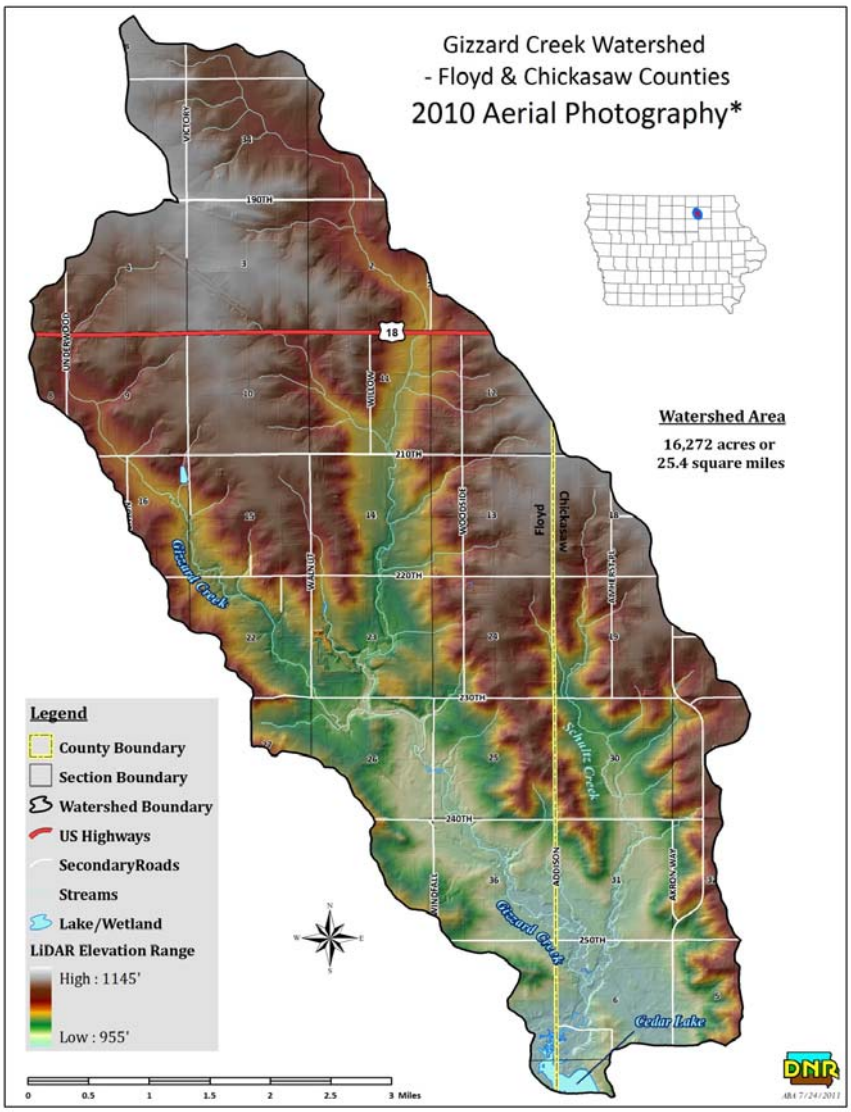
The individual project summaries, found on GRTS, identify local partners and other state and federal agencies which support each project.

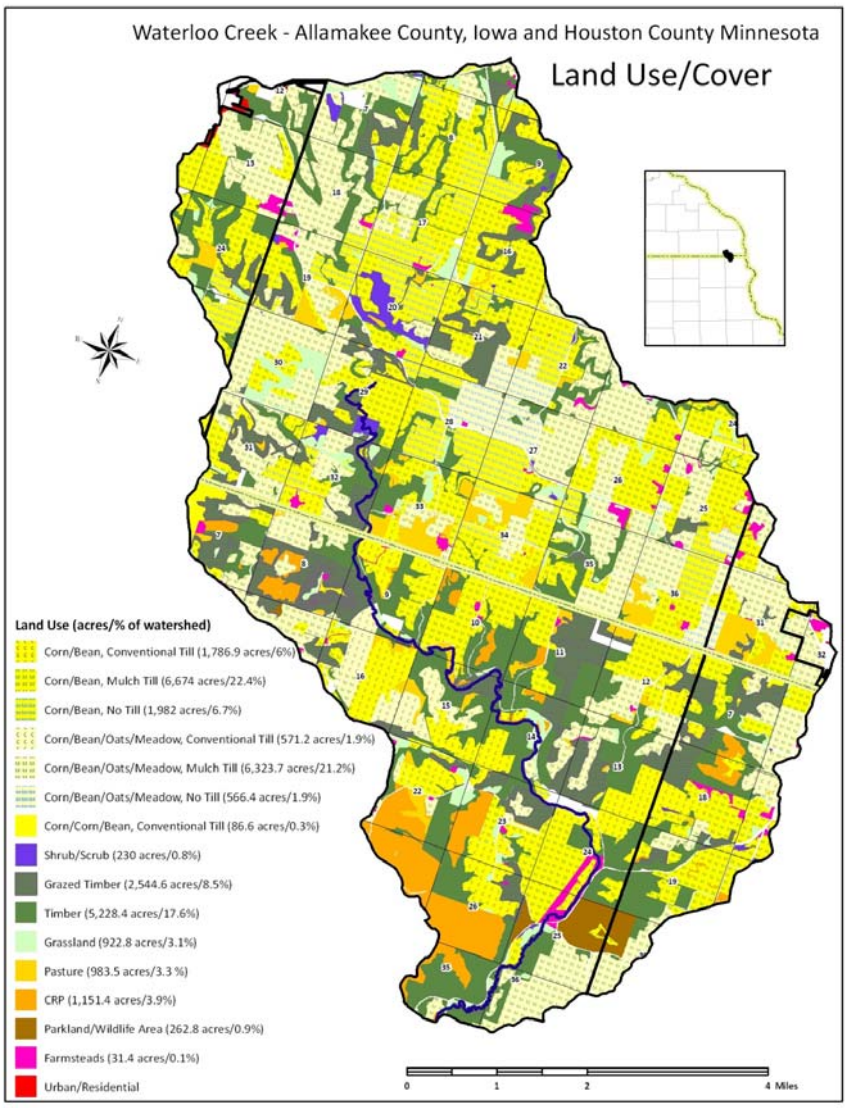
## APPENDIX C

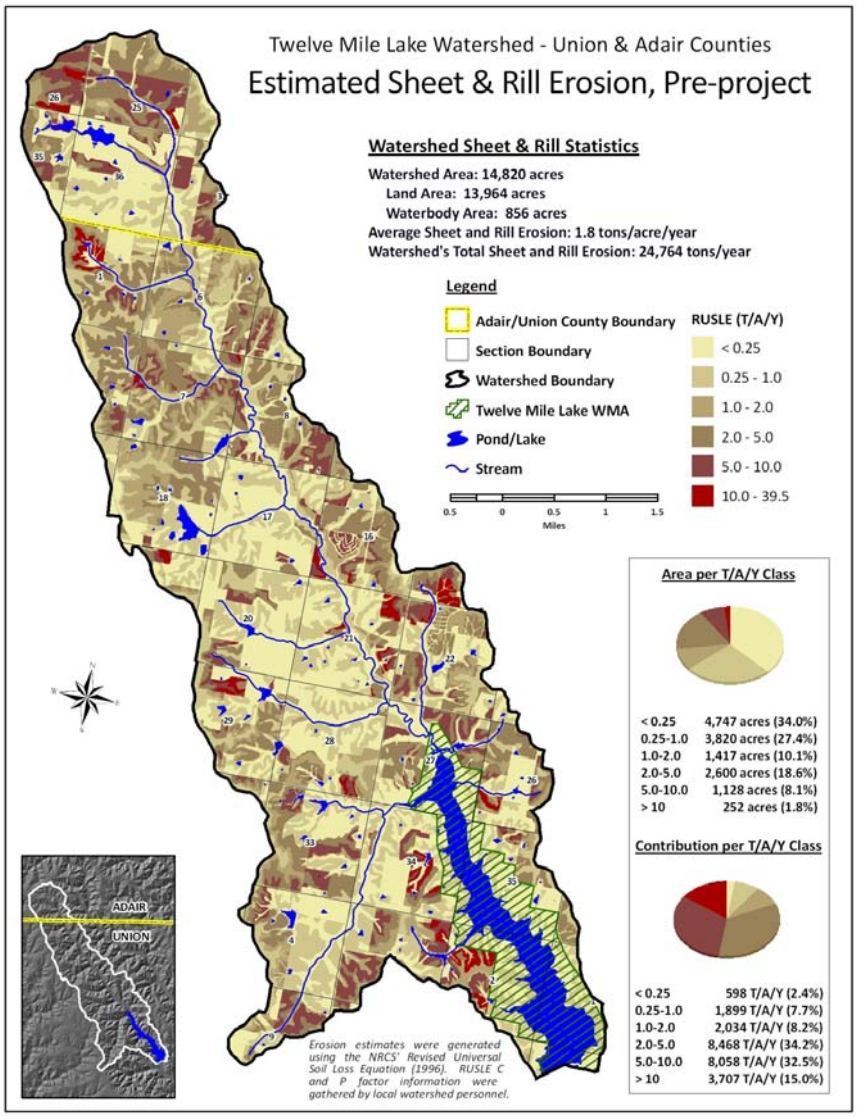
EXAMPLE GIS ASSESSMENT MAPS:

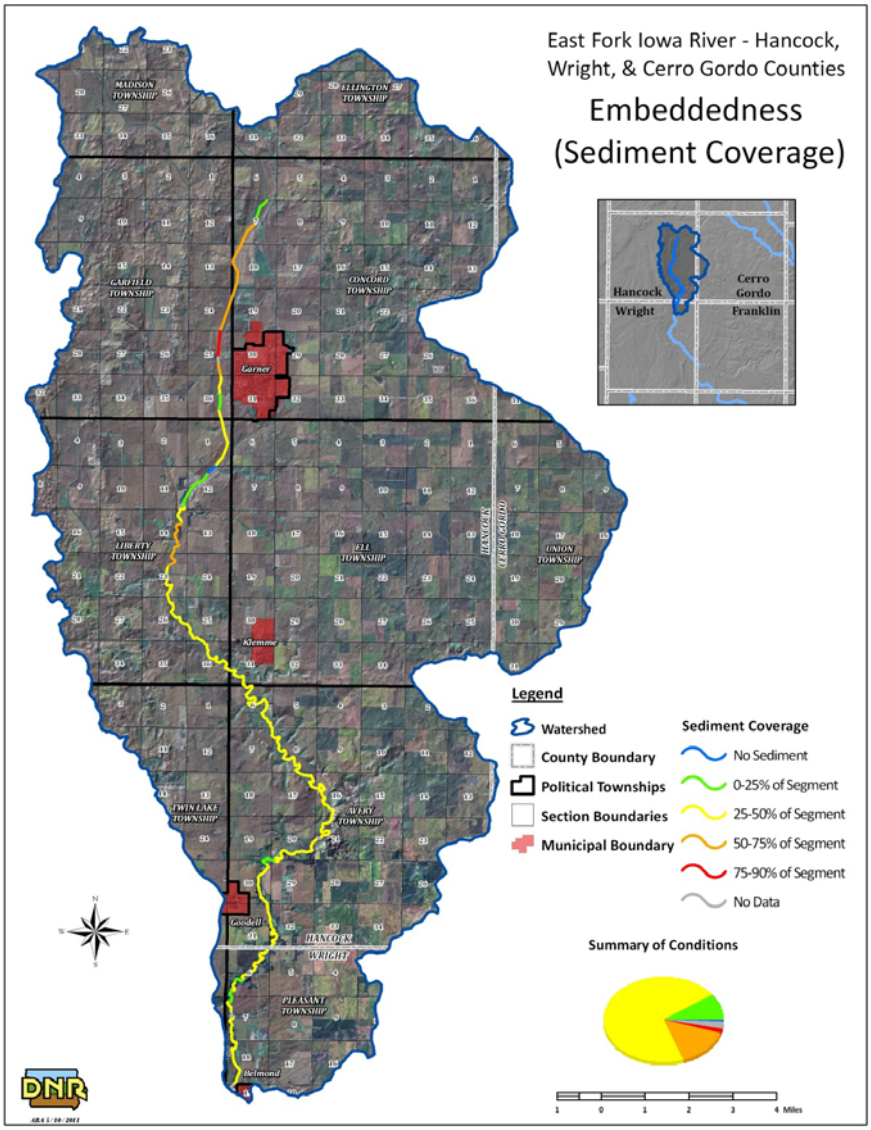


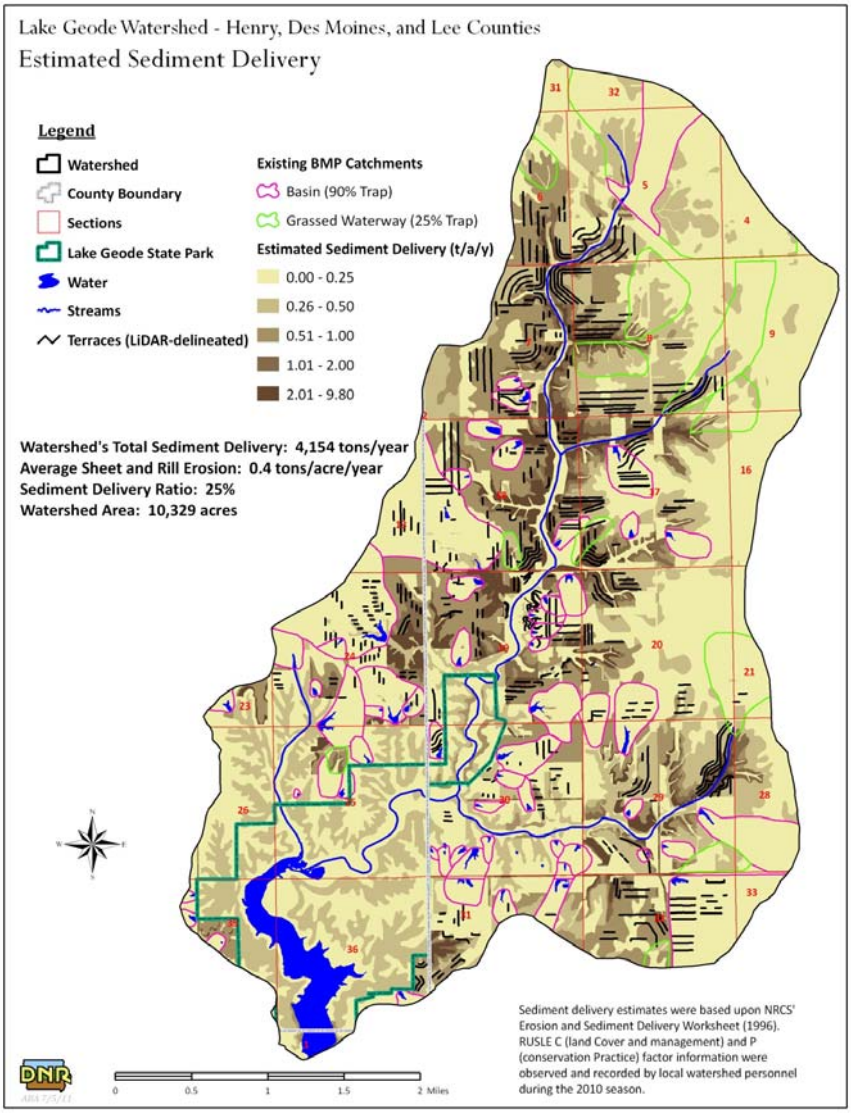

Iowa River Watershed 303(d) List of Impaired Waterways, 2010
Legend
IowaR_Stream_Impairments_ALL
(Green = Bacteria, Orange = Other))
1, Iowa River
2, Iowa River
3, Iowa River
4, Iowa River
5, Iowa River
6, Iowa River
7, Iowa River
8, Iowa River
9, Roff Creek
10, Prairie Creek
11, English River
12, Unnamed Tributary to Snyder Creek
13, Old Mans Creek
14, Ralston Creek
15, Muddy Creek
16, Price Creek
17, Price Creek
18, Bennett Creek
19, Raven Creek
20, South Fork Iowa River
21, South Fork Iowa River
22, South Fork Iowa River
23, South Fork Iowa River
24, South Fork Iowa River
25, Beaver Creek
26, Beaver Creek
27, South Beaver Creek
28, Tipton Creek
29, Tipton Creek
Various Biologic
Impaired Lakes
30-32, Lake MacBride
33, Coralville Reservoir
34, Green Castle Lake
35-36, Iowa Lake
37-38, Kent Park Lake
39-40, Hannon Lake
41, Otter Creek Lake
42, Upper Pine Lake
43-44, Eldred Sherwood Lake
County Boundary
Iowa River Subwatersheds (HUCBs)
Other Streams
10 0 10 20 30 40 50 Miles
WINNEBAGO
HANCOCK
CERRO GORDO
FRANKLIN
WRIGHT
HARDIN
GRUNDY
HAMILTON
TAMA
BENTON
Upper Iowa Subwatershed
STORY
LINN
Middle Iowa Subwatershed
MARSHALL
JASPER
JOHNSON
POWESHIEK
IOWA
Lower Iowa Subwatershed
MUSCATINE
MAHASKA
KEOKUK
WASHINGTON
LOUISA
HENRY
DES MOINES
DNR
ABA 8/15/2011


Gizzard Creek Watershed
- Floyd & Chickasaw Counties
2010 Aerial Photography*
Watershed Area
16,272 acres or
25.4 square miles
Legend
County Boundary
Section Boundary
Watershed Boundary
US Highways
SecondaryRoads
Streams
Lake/Wetland
LiDAR Elevation Range
High : 1145'
Low : 955'
0 0.5 1 1.5 2 2.5 3 Miles
Floyd
Chickasaw
Gizzard Creek
Schulte Creek
Cedar Lake
190TH
210TH
220TH
230TH
240TH
250TH
VICTORY
UNDERWOOD
WILLOW
WALNUT
POSSOM
ADDISON
AKRON WAY
WINGFALL
18
DNR
ABA 7/24/2011


Waterloo Creek - Allamakee County, Iowa and Houston County Minnesota
Land Use/Cover
Land Use (acres/% of watershed)
Corn/Bean, Conventional Till (1,786.9 acres/6%)
Corn/Bean, Mulch Till (6,674 acres/22.4%)
Corn/Bean, No Till (1,982 acres/6.7%)
Corn/Bean/Oats/Meadow, Conventional Till (571.2 acres/1.9%)
Corn/Bean/Oats/Meadow, Mulch Till (6,323.7 acres/21.2%)
Corn/Bean/Oats/Meadow, No Till (566.4 acres/1.9%)
Corn/Corn/Bean, Conventional Till (86.6 acres/0.3%)
Shrub/Scrub (230 acres/0.8%)
Grazed Timber (2,544.6 acres/8.5%)
Timber (5,228.4 acres/17.6%)
Grassland (922.8 acres/3.1%)
Pasture (983.5 acres/3.3 %)
CRP (1,151.4 acres/3.9%)
Parkland/Wildlife Area (262.8 acres/0.9%)
Farmsteads (31.4 acres/0.1%)
Urban/Residential
0
1
2
4 Miles


Twelve Mile Lake Watershed - Union & Adair Counties
Estimated Sheet & Rill Erosion, Pre-project
Watershed Sheet & Rill Statistics
Watershed Area: 14,820 acres
Land Area: 13,964 acres
Waterbody Area: 856 acres
Average Sheet and Rill Erosion: 1.8 tons/acre/year
Watershed's Total Sheet and Rill Erosion: 24,764 tons/year
Legend
Adair/Union County Boundary
Section Boundary
Watershed Boundary
Twelve Mile Lake WMA
Pond/Lake
Stream
RUSLE (T/A/Y)
< 0.25
0.25 - 1.0
1.0 - 2.0
2.0 - 5.0
5.0 - 10.0
10.0 - 39.5
0.5 0 0.5 1 1.5
Miles
Area per T/A/Y Class
< 0.25 4,747 acres (34.0%)
0.25-1.0 3,820 acres (27.4%)
1.0-2.0 1,417 acres (10.1%)
2.0-5.0 2,600 acres (18.6%)
5.0-10.0 1,128 acres (8.1%)
> 10 252 acres (1.8%)
Contribution per T/A/Y Class
< 0.25 598 T/A/Y (2.4%)
0.25-1.0 1,899 T/A/Y (7.7%)
1.0-2.0 2,034 T/A/Y (8.2%)
2.0-5.0 8,468 T/A/Y (34.2%)
5.0-10.0 8,058 T/A/Y (32.5%)
> 10 3,707 T/A/Y (15.0%)
ADAIR
UNION
Erosion estimates were generated using the NRCS' Revised Universal Soil Loss Equation (1996). RUSLE C and P factor information were gathered by local watershed personnel.


East Fork Iowa River - Hancock, Wright, & Cerro Gordo Counties
Embeddedness (Sediment Coverage)
Hancock
Cerro Gordo
Wright
Franklin
MADISON TOWNSHIP
ELLINGTON TOWNSHIP
GARFIELD TOWNSHIP
CONCORD TOWNSHIP
Garner
LIBERTY TOWNSHIP
ELK TOWNSHIP
UNION TOWNSHIP
HANCOCK
CERRO GORDO
Klemme
TWIN LAKE TOWNSHIP
AVERY TOWNSHIP
Goodell
HANCOCK
WRIGHT
PLEASANT TOWNSHIP
Belmond
Legend
Watershed
County Boundary
Political Townships
Section Boundaries
Municipal Boundary
Sediment Coverage
No Sediment
0-25% of Segment
25-50% of Segment
50-75% of Segment
75-90% of Segment
No Data
Summary of Conditions
1 0 1 2 3 4 Miles
DNR


Lake Geode Watershed - Henry, Des Moines, and Lee Counties
Estimated Sediment Delivery
Legend
Watershed
County Boundary
Sections
Lake Geode State Park
Water
Streams
Terraces (LiDAR-delineated)
Existing BMP Catchments
Basin (90% Trap)
Grassed Waterway (25% Trap)
Estimated Sediment Delivery (t/a/y)
0.00 - 0.25
0.26 - 0.50
0.51 - 1.00
1.01 - 2.00
2.01 - 9.80
Watershed's Total Sediment Delivery: 4,154 tons/year
Average Sheet and Rill Erosion: 0.4 tons/acre/year
Sediment Delivery Ratio: 25%
Watershed Area: 10,329 acres
Sediment delivery estimates were based upon NRCS' Erosion and Sediment Delivery Worksheet (1996). RUSLE C (land Cover and management) and P (conservation Practice) factor information were observed and recorded by local watershed personnel during the 2010 season.
0
0.5
1
1.5
2 Miles

## APPENDIX D: STATE MATCH, LEVERAGED & OTHER FUNDS

Iowa's FFY2011 Section 319 state match is provided through funding from a portion of the following state sources: the Water Protection Fund (WPF), the Watershed Protection Fund (WSPF), and Publicly Owned Lakes Fund, all administered by the Iowa Department of Agriculture and Land Stewardship Division of Soil Conservation, plus funding from a portion of the Iowa DNR Lakes Restoration Program. Additional funding this is leveraged with Section 319 funding to implement watershed improvement plans includes funding from the above sources, plus funding provided through the state Watershed Improvement Review Board (WIRB), the State Revolving Fund (SRF), and federal conservation programs administered through the Natural Resources Conservation Service (NRCS),and Farm Services Agency (FSA), plus private funding sources. Other funds that are used to implement nonpoint source BMPs in Iowa, but are not leveraged with Section 319 funds to implement watershed management plans, include funding from federal conservation programs administered through NRCS, FSA, plus funding from private sources. A brief description of nonpoint source funding programs is included below.

### Water Protection Fund

The state Water Protection Fund (WPF) provides funding to county soil and water conservation districts to carry out projects to protect surface and ground waters from point and nonpoint sources of pollution. Overall responsibility for administration of the Water Protection Fund programs and funds is assigned to the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship (DSC). Water Protection Funds currently are provided through the state Resources Enhancement and Protection (REAP) Program.

The DSC has worked closely with the Department of Natural Resources and with other state and federal resource agencies in selecting projects to be funded, with many projects receiving funding from both the Water Protection Fund and from other programs, such as EPA's Section 319 Program. Since 1992, DSC and DNR have jointly solicited proposals for both the Water Protection Projects and the Section 319 Nonpoint Pollution Control programs, and have utilized a common procedure for review of those proposals.

A portion of the REAP soil and water enhancement funds are used for conducting Water Protection Projects, with 50% of the allocation being used for such projects. The remainder of the REAP soil and water allocation is used to support the Water Protection Practices Program being carried out by county soil and water conservation districts. One and one-half percent of the allocation is held in a reserve fund, and the balance is divided equally among the 100 SWCDs.

In SFY2011, the WPF allocated approximately $1.6 million to the following projects:

- Bear Creek Watershed
- Big Bear Creek Watershed

- Big Creek Watershed
- Buckeye Creek Water Quality
- Bur Oak/Turtle Cree Water Quality
- Competine Creek Watershed
- Deer Creek and North Branch Sub Sheds of Clear Creek
- Dry Run Creek Water Protection
- East Fork Grant River Watershed
- Elk Creek Watershed
- Four Mile Creek Watershed
- Fox River Water Quality
- Jordan Creek Watershed
- Kettle Creek Watershed
- Lake Geode Watershed Project
- Lake Hendricks Watershed
- Lake Wapello Nonpoint Source Watershed
- Lizard Lake Watershed Management
- North Thompson River Water Quality
- Onion Creek Watershed Protection
- Prairie Rose Lake Water Quality
- Price Creek Water Quality
- Rathbun Lake
- Silver Creek Watershed
- South Fork Maquoketa River Water Quality
- Upper Catfish Creek Watershed Protection
- Upper Whitebreast Creek Water Quality
- West Tarkio Watershed
- Yellow River Headwaters Watershed

**Iowa Watershed Protection Fund**

The Iowa Watershed Protection Fund (WSPF) is administered by the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation, (DSC). The WSPF was established to accelerate watershed protection efforts in the state. The authorization for these funds is broader than for the Water Protection Fund (WPF) or Section 319 funding. Primary goals include building the capacity of a growing number of local communities to sponsor watershed protection efforts, and providing resources to leverage other funding available at the federal and local level.

This program is supported through an appropriation from the state legislature to develop and encourage integrated approaches to meet multi-objective water quality protection, flood control, erosion control, recreation, wildlife habitat and other resource protection issues. It provides funding for watershed solutions to water quality and water management problems that impact local communities, the state, and the country.

A portion of this funding directly supports watershed protection project implementation. In addition to funding project implementation, WSPF provides matching funds with the Iowa DNR to support to SWCDs in the development of projects and project applications. Using funding of the Development Grants, sponsors are provided additional resources to investigate and assess a potential project and to complete the necessary paperwork to submit an application.

In SFY2011, the WSPF allocated approximately $5 million to the following projects:

- Bear Creek Watershed
- Big Bear Creek Watershed
- Big Creek Watershed
- Buckeye Creek Water Quality
- Bur Oak/Turtle Cree Water Quality
- Camp Creek Watershed
- Competine Creek Watershed
- Darling Lake Watershed
- Deer Creek and North Branch Sub Sheds of Clear Creek
- Dry Run Creek Water Protection
- East Fork Grant River Watershed
- Elk Creek Watershed
- Four Mile Creek Watershed
- Fox River Water Quality
- Green Valley Watershed
- Iowa Great Lakes Watershed
- Jordan Creek Watershed
- Kettle Creek Watershed
- Lake Geode Watershed Project
- Lake Hendricks Watershed
- Lake Wapello Nonpoint Source Watershed
- Littlefield Lake NPS Watershed
- Lizard Lake Watershed Management
- Muchakinock Creek
- North Thompson River Water Quality
- Nutting Creek
- Onion Creek Watershed Protection
- Prairie Creek Water Quality
- Prairie Rose Lake Water Quality
- Price Creek Water Quality
- Rathbun Lake
- Silver Creek Watershed
- Silver Lake Water Quality
- South Fork Maquoketa River Water Quality
- Staff/Beaver Creeks Water Quality

- Tete Des Morts Creek Watershed
- Union Grove Lake
- Upper Catfish Creek Watershed Protection
- Upper Whitebreast Creek Water Quality
- Walnut Creek Watershed
- Watershed Development Grants
- West Tarkio Watershed
- Yellow River Headwaters Watershed

**Publicly Owned Lakes Program**

The state Publicly Owned Lakes Program (POLP) is a component of the Iowa Financial Incentives Program, which provides financial assistance to owners and operators of farmland for installation and use of soil and water conservation practices. The POLP is used to cost share up to 75% of the approved cost of permanent soil conservation practices installed in watersheds of selected publicly owned lakes and reservoirs. POLP funding is administered by the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship (DSC).

The publicly owned lakes or reservoirs eligible for POLP funds are identified on a priority list established annually by the DNR, using the following criteria:

- Any constructed or natural lake having a watershed acreage to lake surface area ratio of less than 80 to 1 and is owned by an Iowa state, county or municipal government.
- A map of the watershed identifying the sources of significant sediment delivery to the lake.
- Documentation of the existence of a watershed plan that targets significant sources of sediment delivery to the lake.

POLP funds may only be used to cost share permanent soil conservation practices. Eligible practices include: critical area planting, diversions and terraces, grade stabilization structures, grassed waterways, and water and sediment control basins. Practice installation is subject to the same general administrative requirements as apply to the state's voluntary cost share program, including entering into a long-term maintenance agreement with the SWCD.

In recent years, Iowa has utilized POLP program funds in combination with funding from other programs in a number of lake watershed projects, including funds from EPA's Section 319 programs.

In SFY2011, the POLP was allocated approximately $347,500 and the following lake watersheds were selected:

- Littlefield Lake, Audubon
- Big Creek Lake, Polk and Boone Counties
- West Lake, Clarke County

- Lake Wapello, Davis County
- Little River Lake, Decatur
- Lake Geode, Des Moines and Henry Counties
- Williamson Pond, Lucas County
- Hawthorn Lake, Mahaska County

**DNR Lake Restoration Program**

The DNR Lake Restoration Program, administered through the DNR Fisheries Bureau, provides funding to complete diagnostic and feasibility (DF) studies for planning lake restoration activities on priority lakes. The DF studies are conducted by the Iowa State University Department of Ecology, Evolution, and Organismal Biology, by private consultants, or by private nonprofit organizations. A component of the studies includes nutrient data both in the watershed and in-lake.

DF studies are currently underway for the following lakes:

- Blackhawk Lake
- Blue Lake
- Minnewashta Lake
- Easter Lake
- Lake Manawa
- Hickory Grove Lake
- Blue Lake

The following lakes, which are currently undergoing lakes restoration activities funded by the DNR Lakes Restoration Program:

- Clear Lake (Dredging, Marsh Restoration)
- Five Island Lake (Dredging)
- Green Valley Lake (Sediment Removal)
- Hawthorn Lake (In-lake Restoration)
- IA Great Lakes (Watershed Protection)
- Lake Darling (Watershed and Lake Restoration)
- Lake Manawa (Dredging and Watershed Restoration)
- Lake Wappello (Watershed Restoration)
- Lizard Lake (Spillway Repair/Fish Restoration)
- Lost Island Lake (Fish barrier/Water Control Structures)
- Meadow Lake (Watershed Improvement)
- Prairie Rose (Watershed Structures)
- Rock Creek Lake (Watershed Improvement)
- Storm Lake (Dredging/Little Storm Lake Restoration)

**DNR Lake Restoration Program Highlighted Project: Clear Lake (Cerro Gordo County)**

Clear Lake is a 3,625-acre natural lake in north central Iowa. It has a watershed to lake area ratio of 2.3/1. In 2001, ISU completed a lake/watershed diagnostic/feasibility study. They presented a number of lake restoration options; specifically dredging of Little Clear Lake and restoration of Ventura Marsh.

• The DNR and local sponsors purchased a 208-acre dredge spoil site with approximately $660,000 of LRP funds and an additional $660,000 local match. Contractors completed the $886,000 containment site in spring of 2008.

• The estimated cost of dredging was $8 million dollars (2.3 million cubic yards at $3.50/cu. yd.). DNR had a January 2008 bid letting for the hydraulic dredging of the Little Lake portion of Clear Lake and awarded the low bidder, L.W. Mattensen of Burlington, Iowa, the $6,453,000 contract (75% LRP and 25% local-match funding).

• Dredging commenced in late spring of 2008 and completed by late summer of 2009. Contractors removed a total of 2.4 million cu. yds.

***Little Clear Lake Pre-dredging***
*(Maximum Depth: 11.9 ft,*
*Mean Depth 4.3 ft)*
***Little Clear Lake post-dredging***
***(****Maximum Depth: 30.0 ft****,***
*Mean Depth 8.5 ft)*

The recently dredged west end of Clear Lake has continued to show improved water quality when compared to pre-dredged conditions. The west end total phosphorus concentration has decreased from 77 ppb when dredging began in 2008 to 53 ppb in 2010 (a **31% reduction**). Likewise, total suspended solids have decreased from 27 ppm in 2008 to 12 ppm in 2010 (a **66% reduction**). Water clarity has increased from 1.8 feet in 2008 to 2.2 feet in 2010 (an **18% increase**). The west-end sampling site has shown better water quality than the other two sites on Clear Lake now that dredging has been completed. Prior to dredging, the west end site showed poorer water quality than the other two sites. Overall, the water quality of Clear Lake has shown substantial improvement over the past ten years that watershed and lake improvements have been implemented

**Section 206 U.S. Army Corps of Engineers**
**Aquatic Ecosystem Restoration Project for Ventura Marsh**

• Construction has started on a Section 206 U.S. Army Corps of Engineers Aquatic Ecosystem Restoration Project for Ventura Marsh, which flows into the west end of Clear Lake. In its present degraded state, the marsh serves as a major source of nutrients contributing to water quality problems in the lake and is a major reproduction area for common carp.

• The Army Corp of Engineers (COE) has $3.2 million earmarked for a Ventura Marsh restoration project. Ventura Marsh state land and in-kind credits of $840,000 and approximately $884,062 in LRP dollars will fund the IDNR's portion of the marsh restoration project.

• The goal is to work with the COE in FY2010 and FY2011 to restore Ventura Marsh and gain water level management capabilities. This will allow for fish removal and revegetation of the marsh.

• The total cost of all above mentioned activities is approximately $17 million. Of this amount, local and federal match represent 40% of the funds necessary to complete these restoration efforts.
• Work completed in 2010 includes a culvert placement under the S14 blacktop (Ventura Grade road) and pre-embankment loading for the pump location. The pump station, removal of old stop-log structure and fish trap, new stop-log structure, and limited dredging in Ventura Marsh will take place in 2011.

***Ventura Marsh Section 206 Project Area***
Anticipated Benefits
Restoration efforts and improvements in water quality have the potential to double the annual economic return that Clear Lake generates to the local economy. The Center for Agriculture and Rural Development at ISU has projected a significant benefit to cost ratio from lake and watershed restoration at Clear Lake. Restoration of Ventura Marsh will improve the water quality of Clear Lake and help keep the Carp population under control. Local groups and DNR Section 319 continue to pursue watershed projects that have the potential to decrease sediment delivery to Clear Lake. In addition, in FY2010 the DNR and Hancock SWCD will cost share on stabilization of critical shoreline areas at McIntosh Woods State Park.

The DNR Lakes Restoration 2011 annual report and 2012 plan are available online at: http://www.iowadnr.gov/Environment/WaterQuality/LakeRestoration.aspx

**Watershed Improvement Review Board (WIRB)**

The Watershed Improvement Review Board (WIRB) was established in 2005 by the Iowa Legislature to provide grants to watershed and water quality projects. The Board is comprised of representatives from agriculture, drinking water and wastewater utilities, environmental organizations, agribusiness, the conservation community along with two state senators and two state representatives.

During FY2011 the Watershed Improvement review board allocated 3.5 million dollars to the following water quality projects:

- Williamson Pond Watershed
- Rathbun Lake Watershed
- White Oak Lake
- Lost Island Lake Watershed
- Bloody Run Creek
- Competine Creek
- Yellow River Headwaters
- Walnut Creek
- Indian Creek
- Iowa Great Lake Targeted Watershed
- Tuttle Lake Watershed

- Des Moines River
- Dry Run Creek
- Twelve Mile Lake Watershed
- Price Creek Watershed
- Duck Creek
- Walnut Creek
- Lake Hendricks
- Lake Icaria Watershed

**http://www.iowaagriculture.gov/IWIRB.asp**

**State Revolving Fund**

The State Revolving Fund (SRF) is one of Iowa's primary sources for investments in water quality and protection of public health. Two funds, for drinking water and for water pollution control, have provided low-cost financing worth more than $1.88 billion to Iowa communities, farmers, watershed groups, and others. The Iowa SRF is operated through a partnership between the Department of Natural Resources (DNR), and the Iowa Finance Authority (IFA). DNR administers the environmental and permitting aspects of the programs, with IFA providing financial assistance including loan approval and disbursements.

The SFY 2011 total included:

- $269 million to design and construct wastewater treatment upgrades, sewer rehabilitation, combined sewer overflow correction, and new collector and interceptor sewers.
- $50 million to design and construct water treatment, storage, and water supply projects;
- $24 million for nonpoint source projects to prevent soil erosion, manage manure, replace inadequate septic systems, improve storm water management, and conserve land for water quality and habitat protection.

The complete 2011 SRF annual report can be accessed at:
http://www.iowasrf.com/media/cms/SRF_2011_ANNUAL_REPORT_BC453FEC22CA8.pdf

**Natural Resource Conservation Service 2011 Iowa Program Summary**

2011 Iowa Farm Bill Program Funding:

Conservation Stewardship Program (CSP) $10.5 million
Environmental Quality Incentives Program (EQIP) $25 million
Agricultural Water Enhancement Program (AWEP) $100,000
Grassland Reserve Program (GRP) $300,000
Wetlands Reserve Program (WRP) $35.6 million

Wildlife Habitat Incentive Program (WHIP) $275,000

Of the 125 conservation practices available to farmers and landowners in Iowa in 2011, the top five are as follows: 1) terraces, 2) crop rotation, 3) mulch till, 4) no-till/strip-till and 5) contour farming.

NRCS Publication:
Minimize runoff and reduce downstream nutrient loading in the Mississippi River Basin.

What NRCS IA is doing?
The major watersheds which feed the water supply for Iowa's largest metropolitan area are participating in one of the 11 Iowa Mississippi River Basin Healthy Watershed Initiative (MRBI) projects. This project, sponsored by the Agriculture's Clean Water Alliance (ACWA), is designed to assist farmers reduce nutrient loading of the North Raccoon and Boone rivers through adaptive management. Participating farmers will be required to use nitrogen stabilizers in their operations as well as implement a minimum of two other practices, such as cover crops or stalk testing to help manage nutrients. ACWA's membership consists of leading agricultural retailers in the Raccoon River and Des Moines River watersheds. ACWA members are aware of their dual mission to help farmers improve agronomic performance in the field while supporting environmental performance beyond the field's edge. More information may be found on the website: http://www.ia.nrcs.usda.gov/

**Farm Services Agency**

Conservation Reserve Program (CRP)
Provides a voluntary program to agricultural producers to help them safeguard environmentally sensitive land. Producers enrolled in CRP plant long-term, resource-conserving covers to improve the quality of water, control soil erosion, and enhance wildlife habitat. In return, CCC provides participants rental payments and cost-share assistance. Contract duration is between 10 and 15 years.

Conservation Reserve Enhancement Program (CREP)
As the name implies, this program is an enhanced version of the very successful Conservation Reserve Program (CRP). CREP is a special conservation program that allows the CRP to be tailored to meet the needs of the State. CREP is a Federal-State conservation partnership program that targets significant environmental effects related to Agriculture. The website may be found below:
http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=landing