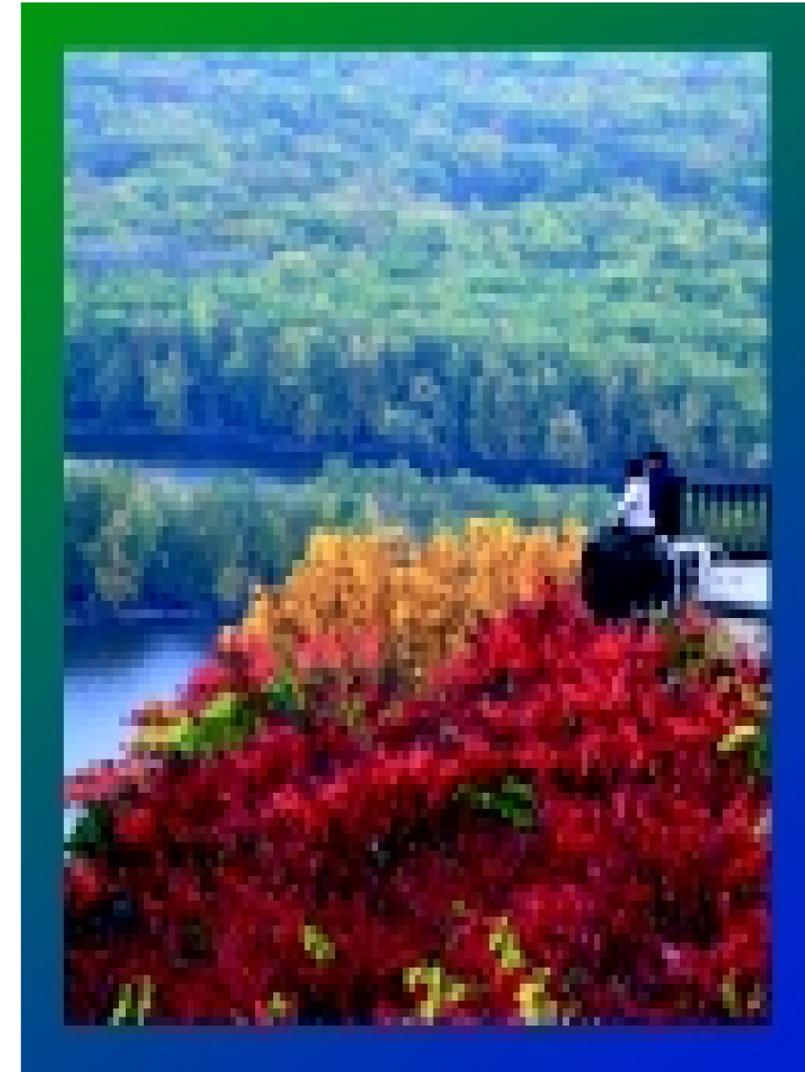


# Iowa Watershed Task Force Report 2001



Source: Iowa Department of Natural Resources

*A lake or river, a wetland or a floodplain  
is a reflection  
of its watershed and its health.*



FATTY BESS  
IOWA DEPARTMENT OF AGRICULTURE

# IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP

Spring 2003

To the Legislature and the Citizens of Iowa

Watersheds reflect the way our landscape functions. Or, as participants in the Iowa Task Force so aptly put it, "A watershed is everything between the rain and the stream, including humans, as well as land, air, plants and animals. All humans have a stake in the watershed where they live."

This Iowa Watershed Task Force Report responds to the charge set forth by the Iowa Legislature to study the condition of watershed protection in Iowa. In doing so, it reflects a wide variety of perspectives and interests, and presents solid ideas for a stronger, more integrated framework for Iowa's watershed work now and in the future.

On behalf of the Iowa Department of Agriculture and Land Stewardship, I want to thank the many individuals and agencies who gave generously of their time and expertise to participate in the Iowa Watershed Task Force. They attended meetings, answered questions, provided information and contributed in other ways to develop the material in this report.

Their message is clear. How we treat our watersheds has implications for water quality and quality of life, public safety and public policy. I encourage you to give these ideas careful consideration in tailoring current programs and developing future priorities for watershed-related programs in the State.

Sincerely,

Patty Bess  
Secretary of Agriculture

## Appendix 4: Program Description Template for Watershed Clearinghouse

Program Name & Responsible Agency/Organization	Funding Source	Purpose of the Program	Type of Activity the Program Funds	Funds (\$) Available/ Requested/ Allocated to the last 3 fiscal years	Special Program Conditions	Eligibility/ Application details	Recommendation for program changes	Number of Program/Financial/Physical	Program Information Contact Person(s)





Map Sheet No.	Location	Project Name	Watershed Type	Funding Sources	Project Coordinates
1	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
2	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
3	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
4	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
5	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
6	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
7	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
8	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
9	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
10	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
11	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
12	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
13	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
14	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
15	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
16	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
17	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
18	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
19	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
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22	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
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26	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
27	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
28	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
29	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288
30	Adrian	Adrian County Water Quality Project	U	UW	Adrian Watershed, DEC, 181-281-1288

**PREFACE**

Thinking and acting in terms of watersheds is not new in Iowa. The state’s history includes some of the nation’s first watershed projects. Often enough, these projects have achieved dramatic results, thanks to the dedication of some of Iowa’s early conservationists. There are photos and maps to document their achievements — huge gullies healed to slow soil erosion, flood impacts prevented downstream and recreational opportunities created around scenic lakes.



Source: Iowa Department of Natural Resources

*Environmental quality is important economically and culturally to the state.*

Unfortunately, there has never been enough money or leadership to recreate these successes statewide, nor even to maintain existing projects. And today’s needs extend further. Iowans, like their counterparts nationally, are affirming the need for comprehensive, landscape-based watershed approaches that can help solve pressing problems. The call is to “connect the dots” between many types of land uses in many locations, and in the process, protect the productivity of the land, the quality of the water and the integrity of the environment for Iowans now and in the future.

The importance of this was affirmed by several thousand state residents who participated in development of *Iowa 2010: A Strategic Planning Initiative*. The 2010 plan, which charts a 10-year course for the state, includes strong language on the importance of “clean water, clean air, healthy soil” as essential to human health, businesses, agriculture, recreation, tourism and superior quality of life. One of the 2010 action steps highlights the importance of the watershed approach: “Identify five watershed models from successful programs in Iowa and other Midwestern states to use in developing Iowa watershed program guidelines, technical assistance and sustainable program funding sources.”



Source: Natural Resources Conservation Service

*The state’s history includes some of the nation’s first watershed projects. Here a gully stabilization structure is being installed in a gully in the 1950’s.*

This report of the Iowa Watershed Task Force contains short case studies from our own state that are model watershed efforts. Whether from Iowa, the Midwest or an example from far away, a strong local identity is a common element of most successful watershed models. To be successful, watershed efforts must be locally directed and supported, and build on community interests to protect people, infrastructure and natural resources. The best projects also tend to be “multi-objective” or comprehensive in nature, seeking efficiencies through planning and management to meet multiple needs. These needs include sustainable economic development and protection of water quality, often along with flood prevention and hazard mitigation. They may also incorporate recreational development, wetland and riparian area conservation, conservation of natural and even cultural heritage, and other goals.

Independence, Iowa, is one of many good examples. After repeated flooding, when the Wapsipinicon River again left its banks in 1993, the town turned the disaster into an opportunity

to improve the overall quality of life, while helping landowners recover. Residents developed a plan to convert flood buyout property to green space. New baseball, football and soccer fields were also developed, with assistance from the John Deere plant in nearby Waterloo. The comprehensive approach alleviated a constant drain on precious emergency resources and created an attractive downtown park. In addition, benefits to water quality and public health came from removing sanitary sewer and septic infrastructure from direct interaction with flood waters, and the project also avoided damage to infrastructure and housing, generally improving long-term community sustainability.



Source: Iowa Emergency Management Division

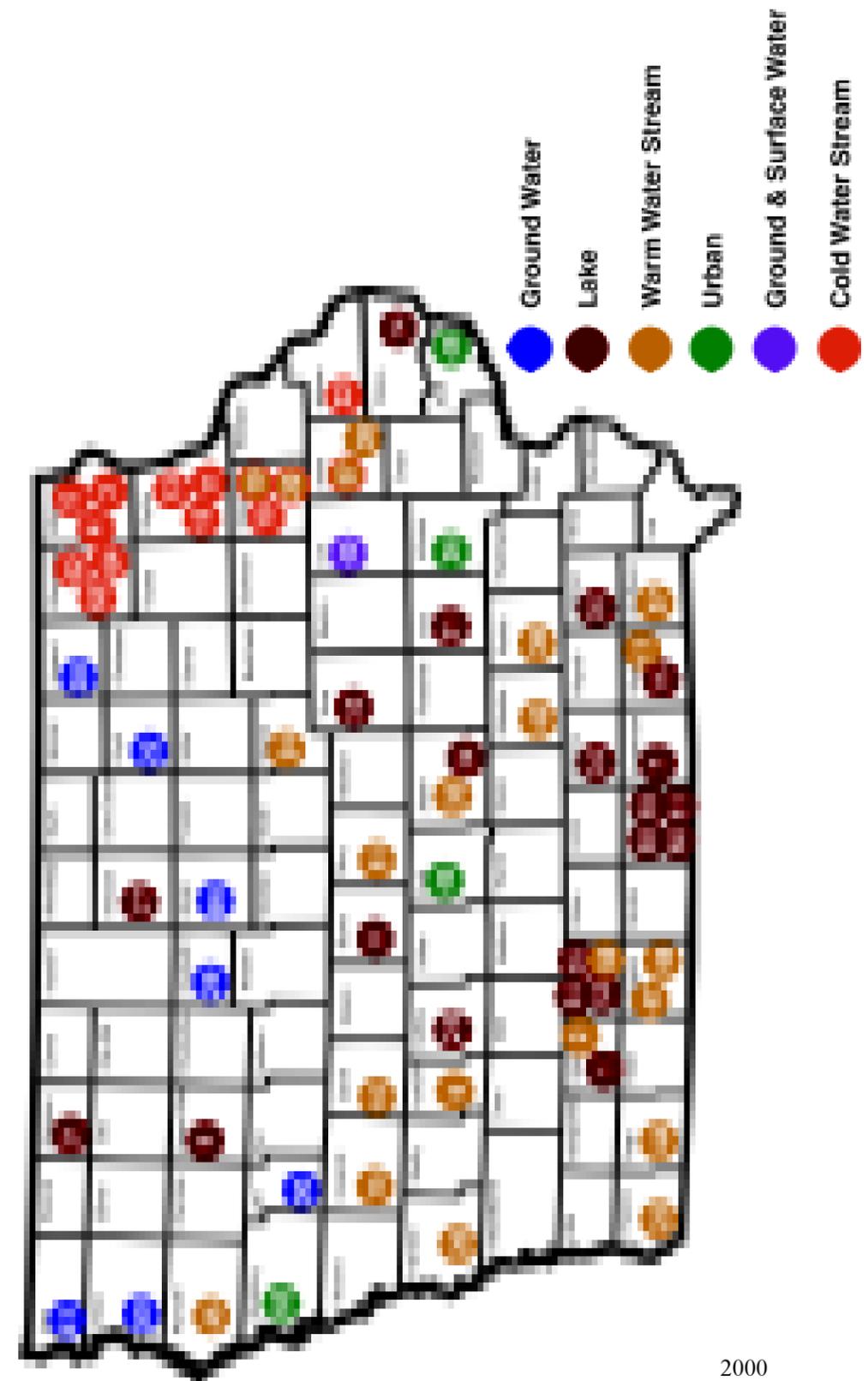
*Repeated flooding in Independence led the community to convert some of the floodplain to recreation area, alleviating a constant drain on emergency resources.*

Such success stories are inspiration for the future. How can Iowa design a more supportive framework for communities such as Independence to expand and improve watershed efforts that benefit public safety and health, environmental quality and overall quality of life? The answers are not simple or cheap. Every watershed management topic represents many associated questions and many unknown variables, including unmet monitoring needs, yet-to-be developed geographic information system data and complications related to social, economic and political acceptability. Resources are also critical. For the community of Independence, a federal and state land buyout program was the basis for developing a set of creative community options.

During the watershed task force process, examples of programs from other states were presented, as was the history of watershed protection in our own state. In neighboring Nebraska, natural resource districts along watershed boundaries were created in 1969 when a number of existing authorities responsible for water and soil concerns were combined and realigned. A few years later, an effort here at home to organize Iowa into watershed conservancy districts generated considerable controversy. It ultimately did not succeed at bringing people together across large watersheds to solve problems, and was repealed before receiving funding to carry out the plans that were developed. The more successful history of the U.S. Department of Agriculture small watershed program in Iowa was also explored in meetings, and a number of today's water quality efforts were showcased, including Minnehaha Creek in Grundy County and Lake Rathbun's Land and Water Alliance in several south-central counties (see Appendix 3: Iowa Water Quality Project Directory).

Through the watershed task force process, a diverse group of Iowans have given their time and ideas as they considered the examples above, along with much additional information. In searching for better understanding of the needs and devising a plan of action, they were able to find a good deal of common ground. The results of their work is represented here in examples, issues, needs and a set of goals with recommendations that will move Iowa's watershed programs forward into a new century.

### Appendix 3: Iowa Water Quality Project Directory



8. **Find Resources.** Funding helps fuel successful programs and projects. Look within the watershed or community for financial support, technical assistance and in-kind support, as much as you look outside at grants and government sources. Don't be afraid to ask for free advice and in-kind services. A clear, well-defined plan and organizational structure can help in obtaining grants or other funding.
9. **Include Youth.** Don't forget to consider including youth in some fashion in the planning and implementation stages. Watershed projects provide often provide a variety of educational opportunities. Youth are often eager to work and learn, and they are great to feature in publicity or fundraising efforts.
10. **Practice Patience, Patience, Patience.** We didn't get where we are today overnight, and we won't get to where we're going tomorrow. When you set lofty goals, break them down into smaller steps. Before you know it, you will be well on your way to success. Keep in mind that conflict can be healthy. Conflicting ideas often represent alternate views that can be productive for the group's efforts and the long-term health of the watershed.

**Watershed Stakeholders**

Successful watershed projects are inclusive. Representation will vary in every watershed, but the following types of individuals and groups need to be considered as participants.

Local Flood Plain Managers	SWCD Commissioners
Planning & Zoning	Water Treatment Facilities
Rural Water Districts	Residents of Watersheds
Sewage Treatment Facilities	Local Businesses and Industry
Non-Profits and Institutions	Legislators
Teachers and Students	Contractors and Builders
Drainage and Levee Districts	County Sanitarians
Public Works Department	Local Farm Organizations
Local Emergency Managers	Golf Courses/Lawn Care
Chamber of Commerce	Supporting Agencies
Local Environmental and Conservation Groups	
Mayors and City Council Members	

**I. EXECUTIVE SUMMARY**

According to the draft definition of a watershed, developed by a group of Iowans involved in the Iowa Watershed Task Force, "A watershed is everything between the rain and the stream. 'Everything' includes humans as well as land, air, plants and animals. All humans have a stake in the watershed where they live."

The truth of this has long been recognized in this state, where variations of a watershed approach have been used since the 1940s to develop local water quality and flood control projects. Unfortunately, these projects which are scattered around the state, have not been supported by any comprehensive state framework. Nor have they always considered possibilities for an integrated approach to address multiple problems and solutions.

**Mission**

*The Iowa Watershed Task Force was charged with studying the condition of watershed protection in Iowa, with the intent to develop a framework for enhanced cooperation and coordination between state, federal and local government, the private sector and the public regarding multi-objective needs for soil conservation, water quality protection, flood control and other natural resource conservation issues in the state's watersheds.*

The need to do more and do it more systematically was recognized by the Iowa Legislature in 1999 when it passed measures to authorize and fund a new Watershed Protection Program (see Section IV: Essential Tools for Watersheds). In its first two years, the legislative mandate included an Iowa Watershed Task Force and funding of almost \$4 million for new watershed protection grants to local communities. This fledgling Watershed Protection Program is sponsoring successful projects around the state. Even so, grants represent only a small part of an overall program. Participants in the Iowa Watershed Task Force encourage the state to consider these recommendations as guiding principles and recommendations for continuing a state Watershed Protection Program and turning it into a framework that can serve the needs of all the state's watersheds for information, technical assistance and leadership.

This document represents the final report of the Task Force, following an interim report presented in January 2000. It was prepared with the involvement, input and assistance of individuals representing state, federal and local agencies, private industry, academic institutions, non-governmental organizations and private citizens. These individuals participated in a Steering Committee, which provided overall guidance for the development of final recommendations, or in one of three workgroups convened to provide specific input on scope and priorities, program development and implementation, and local outreach and communications.



Source: Iowa Emergency Management Division  
*A diverse group of Iowans participated in the Iowa Watershed Task Force.*

### Guiding Principles for an Iowa Watershed Framework

Citizens participating in the Task Force process developed the following principles to guide their work and the recommendations in this report.

- Create a planning-based, systematic framework to support watershed problem solving
- Emphasize multiple objectives in watershed programs
- Allow flexibility for projects to address problems as they exist in different settings and landform types/ecoregions, and not focus too tightly on one narrow set of approaches, practices or technologies
- Strive to facilitate voluntary implementation of best management practices and willing compliance with existing laws
- Provide funding to better support enforcement of existing regulations
- Acknowledge the importance of agriculture in our history and current economy
- Address all types of impacts on water resources, including agricultural, commercial, industrial, municipal and residential
- Base programs on measurable, attainable standards
- Promote a more holistic view of how to measure watershed benefits and functions; include sustainable economic, social and environmental goals
- Appreciate that water is a shared resource; thus, improving watershed functions is a responsibility that all Iowans share

### Summary of Goals and Recommendations

The goal statements that follow are adapted from language in the original legislation establishing the Iowa Watershed Task Force. They are used as the basis for organizing the recommendations of the Task Force.

#### **Goal: Develop a Framework for Enhanced Cooperation and Coordination**

##### *Recommendations*

1. Establish an on-going coordinating body to continue to address the watershed issues identified by this Task Force. Include similar representation from state, federal and local agencies, nonprofits and commercial interests, as on the Watershed Task Force. Create a “home” for this coordinating entity within the Iowa Department of Agriculture and Land Stewardship.
2. Conduct a statewide needs assessment, in cooperation with appropriate local and federal agencies, to more specifically identify water resource problems and to quantify funding needs.

#### **Goal: Increase State Support for Watershed Protection**

##### *Recommendations*

1. Establish a legislative study committee to explore in more detail the specific needs for financial support for watershed-related programs and creative sources of funding beyond the state’s General Fund. Take better advantage of opportunities to leverage funds available from federal and other sources.

## Appendix 2: Local Workgroup Material

### *Ten Elements of Successful Watershed Initiatives*

1. **Embrace Opportunities.** Sometimes groups come together to proactively work to prevent future problems, but often it takes an identified problem for groups to come together. That’s human nature. Recognize which situation you are in and embrace the opportunity. Celebrate your successes along the way to keep the group motivated.
2. **Identify Core Stakeholders.** Recognize you may not be able to start the effort with a large group. Small discussions with key resource professionals and community leaders may be necessary. The core group will need to begin to formulate their ideas about the general problem and broad possible solutions, but should avoid portraying these as the only problems and solutions. These early, small group ideas are a way to generate community interest and solicit participation. The media may become involved at some point to help generate awareness. The core group may change as the partnership develops, and may evolve into a more formal steering committee or executive committee.
3. **Enlist Community Leadership and Facilitation.** Involve people in the community who are viewed as consensus builders to help provide leadership. Consider the need to assist local leaders with a neutral trained facilitator who can help diverse stakeholders reach a consensus, plant new or different ideas and assist the group in nurturing those new ideas. Effective watershed leaders are good communicators because they listen to others’ ideas, make sure every idea is considered and respect all stakeholders’ ideas.
4. **Invite Everyone to the Table.** We all live in a watershed, and we all contribute to the problems and solutions. Everyone who has a stake should be invited to be included from the beginning. This helps the group build consensus on what needs to be done and who can do it. Find creative ways to include critical stakeholders, since leaving them out of the process at any step may cause unnecessary problems later. Don’t forget the local experts who can contribute ideas and knowledge.
5. **Gain Organizational Support.** Think about the key community service and professional organizations, such as Lions Club, Jaycees, Parent Teacher Association, etc. Who can bring volunteers to the group? Think about the specific leaders of these groups and consider recruiting them early on to be part of the core group. Their leadership can be critical in gaining their organizations’ active and financial support later.
6. **Develop Clear Goals, Objectives and Priorities.** The front-end planning process is critical to your ultimate success. You must have clear goals and objectives and set priorities for activities. Take your time and do it right the first time (you may only get one chance). This will help the group understand what it is doing and why, and also help you attract funding for your efforts and avoid chasing funding that will tempt you into peripheral activities. Good planning also makes the implementation phase easier and quicker. Remember to consider how you will evaluate progress and success during the early planning stages.
7. **Think Small.** The smaller the watershed, the easier the partners can connect or relate to it. In addition, the smaller the watershed, the faster it will react to changes in management practices.

2. Encourage state agencies to provide more active leadership in conducting programs consistent with principles of sound watershed and floodplain management.
3. Establish an ongoing, staffed watershed clearinghouse at Iowa State University for data and grant information.
4. Support the statewide water quality monitoring plan, developed by the Iowa Department of Natural Resources.
5. Continue funding for GIS programs, as described by the Iowa Water Quality Initiative, and ensure that local watershed organizations have free access to, and training to use, computerized landscape information.
6. Develop or expand sustainable, smart growth development initiatives to address watershed goals.

***Goal: Build Local Capacity for Watershed Initiatives***

*Recommendations*

1. Encourage and assist development of local watershed councils by providing state support and technical assistance.
2. Revise current state watershed grant program guidelines to better support local watershed-oriented planning and implementation initiatives. Provide structure while allowing flexibility.
3. Increase the emphasis on watershed planning in grant programs, with resources made available to build local capacity in communities or regions for planning-related activities, including assessment and group facilitation.

***Goal: Emphasize the Role of Watershed Efforts in Flood Hazard Mitigation***

*Recommendations*

1. Work cooperatively with all levels of government to fund development and periodic updating of statewide floodplain maps.
2. Fund increased floodplain education for local governments, along with incentives to encourage action.
3. Strengthen procedures for conducting environmental review of economic development funding when projects are proposed in flood-prone areas.
4. Continue working to strengthen coordination between planning efforts in the areas of hazard mitigation, economic development and watershed protection.

***Goal: Encourage Citizen Involvement***

*Recommendation*

1. Initiate a public outreach and marketing campaign to build on existing and past efforts to increase awareness and appreciation of watershed issues.
2. Continue to encourage involvement by diverse stakeholders in watershed programs.
3. Support education efforts with youth and adults that heighten awareness, develop understanding and support local engagement on watershed issues.
4. Increase the emphasis on local social and economic issues in addressing watershed protection and improvement programs.

## Watershed Task Force Participants

Listing indicates involvement and support, but does not indicate endorsement of all items within the Report. Those listed have participated in at least one meeting and/or have submitted written comments.

### Steering Committee

State of Iowa  
Iowa Department of Agriculture and Land Stewardship - Division of Soil Conservation (IDAS-DC)  
Jim Gilliford, Chair  
Ann Robinson, Project Coordinator  
Dean Lenke  
Iowa Department of Natural Resources (IDNR)  
Lyke Hall  
Iowa Emergency Management Division (IEMD)  
Steve Zimmerman  
Dennis Harper  
Iowa Department of Transportation (IDOT)  
Mark Mettler  
Iowa Department of Cultural Affairs (IDCA)  
Doug Jones  
Federal Agencies  
US Environmental Protection Agency (USEPA)  
Jill Hefling  
US Natural Resources Conservation Service (NRCS)  
Marty Adkins  
Federal Emergency Management Agency (FEMA)  
Sandy Cox  
US Army Corps of Engineers (USACE)  
Leo Foley  
US Geological Survey  
Robin Michelenis-Brown  
Individuals & Organizations  
Conservation Districts of Iowa (CDI)  
Dan Buene  
Des Moines Water Works  
L.D. Millen  
Iowa Association of County Conservation Boards  
Don Bazelon  
Iowa Association of Municipal Utilities  
Karen Nadtman  
Iowa Audubon Council  
Jane Clark  
Iowa Environmental Council  
Susan Hestrote  
Iowa Farm Bureau Federation (IFFB)  
Rick Robinson  
Iowa State Association of Counties (ISAC)  
Bob Mulqueen  
Iowa State University (ISU)  
Geah Miller  
Iowa League of Cities  
Koni Wiswell  
Iowa Watersheds (IW) and Ribbon Land and Water Alliance  
John Glen  
Trees Forever  
Shannon Rausay  
Veenstra and Kimm Inc.  
Ted Pysear  
Wallace House Foundation  
Kent Newman

### Scope & Priorities

**Workgroup**  
Marty Adkins - NRCS, Co-Chair  
Ann Robinson - IDAS-DC, Co-Chair  
Andrew Hig - Staff Assistant  
Al Austin - Iowa Water Resources Research Institute  
Don Borneau - IDNR  
Susan Brown - ISU  
Bill Capuccio - IDNR  
Mike Carlson - IDOT  
Sandy Cox - FEMA  
Steve Davies - ISAC  
Leo Foley - USACE  
Jim Johnson - ISU  
Richard Kelley - University Hygienic Laboratory  
Gerald Kennedy - US Department of Transportation  
Jon Waters - Atlantic Municipal Utilities  
Deanna Poelfs - Iowa Select Farms  
Deb Ryan - CDI  
Dane Sand - Iowa Natural Heritage Foundation  
Jeanette Schrafer - USEPA  
Glen Siders - Southgate Development  
Vickie Stoller - Iowa Drainage District Association  
Roger Wolf - IW and Iowa Soybean Association  
Steve Zimmerman - IEMD  
Program Development and  
**Program Development & Implementation Workgroup**  
Ted Pysear - Veenstra and Kimm Inc., Co-Chair  
Dennis Harper - IEMD, Co-Chair  
Tom Oswald - NRCS, Staff Assistant  
Roy Barble - Iowa Soybean Association  
Lori Bestgen - FEMA  
Gene Blanshan - Greene County Supervisor  
Tom Carpenter - Carpenter Landscaping  
Bob Christian - Economic Development Authority  
Jim Gillespie - IDAS-DC  
Roger Howell - State Soil Conservation Committee (SSCC)  
Jess Jackson - Iowa Heartland RC&D  
Mark Jensen - NRCS  
Doug Jones - IDCA  
Jon Judson - Lake Parkoza Watershed  
Michelle Lantemans - Information Technology Department  
Richard Leopold - IDNR  
Doman Otto - USDA Rural Development  
Loren Low - Polk County Conservation Board  
Kent Newman - Wallace House Foundation

Fred Saul - Iowa Northland Regional Council of Governments  
Jennifer Simons - IDNR  
Michael Smith - Iowa Attorney General's Office  
Jodi Stahell - USACE  
Jim Stricker - IDNR  
Paul Widemeier - Polk Soil & Water Conservation District (SWD)  
Dale Wight - Crawford County Engineer

### Communications & Local Outreach Workgroup

Shannon Rausay - Trees Forever, Chair  
Betsy Ortman - IDAS-DC, Staff Assistant  
Paul Assman - Crawford County Project Impact  
Ernie Aust - IW  
Carol Balvarz - Iowa Cattlemen's Association  
Michael Clay - North Central Regional Center for Rural Development (NCRCD)  
Joe Colletti - ISU  
Peter Corrigan - National Weather Service  
Corwin Fee - Marion SWD  
Stephen Gasteyer - NCRCD  
Bob Goldhammer - Polk County Emergency Management Agency  
Muffy Harmon - SSCC  
Peggy Murdoch - Story County Water Quality Coalition  
Joe Myhre - Northern Iowa Council of Government  
Carl Neifert - ISU  
Richard Pirog - Leopold Center for Sustainable Agriculture  
Sally Rutman - Farmer  
Rick Robinson - IFFB  
Margo Underwood - Governor's Strategic Planning Council  
Mimi Wagner - ISU

### Additional Technical Help

Udo Agera - IDNR, Reviewer  
Kevin Baskins - IDNR, Contributor  
Todd Bishop - IDNR, Contributor and Reviewer  
William Elm - IDNR, Reviewer  
Marcia Grimm - IDAS-DC, Logistical Support  
Michael Hill - Contributor  
Bernard Hoyer - IDNR, Reviewer  
Elaine Ivess - IDAS-DC, Logistical Support  
Teresa Qheim - Report Editor  
Jack A. Shaffer - Report Designer

included establishment of the Leopold Center for Sustainable Agriculture at Iowa State University and an Environmental Health Center at the University of Iowa.

Iowa's landmark Resource Enhancement and Protection Program (REAP) passed unanimously in 1989, with provisions for a Water Protection Fund (WPF) for practices and projects. It received \$15 million in first-year funding.

The Hazard Mitigation Grant Program was created in 1988 by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to assist states and local communities in implementing long-term hazard mitigation measures following a major disaster declaration.

### 1990s

The 1990 Food, Agriculture, Conservation and Trade Act (FACTA) authorized a new Wetlands Reserve Program (WRP), a voluntary program responsible in Iowa for almost 36,500 acres of wetlands and associated buffers restored through fall 2000.

Federal agencies introduced a new "Clean Water Action Plan" in 1998, highlighting long-term movement toward a more integrated watershed approach to address water quality problems. The plan supported the need for more attention and funding for nonpoint source problems.

**1950s**

The landmark Hope-Aiken Watershed Protection and Flood Prevention Act, P.L. 566 was passed to “bridge the soil and water conservation gap” existing between the SCS’ work with the individual farmer on land treatment measures and the Corps of Engineers’ large downstream dams. Funding was appropriated for 62 pilot projects nationwide. Four Iowa watersheds were on the list: Mule Creek in Mills County, Honey Creek in Lucas County, Upper Plymouth Creek in Plymouth County, and Nassau in Sioux County. Eventually 2,389 watershed and flood control dams were built in Iowa, 23 percent of the total number nationally built by the SCS, later the Natural Resources Conservation Service (NRCS).

The Iowa General Assembly enacted an amendment to the conservation districts law, allowing for establishment of subdistricts that could stretch beyond county boundaries to follow watershed boundaries, to be financed by an annual tax on agricultural land or a special benefit assessment. Subdistrict powers include eminent domain.

**1960s**

The scope of P.L. 566 was broadened to include new types of sponsors and to include public recreational development as a goal. Condemnation powers were expanded under the law.

The National Flood Insurance Program (NFIP) was established in 1968 to enable property owners in participating communities to purchase insurance protection against losses from flooding. Participating communities must adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in areas designated as flood hazards.

**1970s**

In 1971, the Iowa General Assembly passed the Soil Loss Limit Law, to be administered by soil and water conservation districts, and established water conservancy districts. The conservancy districts, later called water resource districts, mandated planning based on large watersheds. The districts were given broad powers but no funding, generated considerable controversy and were repealed in 1986.

Congress passed the 1972 Clean Water Act (CWA) “to restore and maintain the chemical, physical and biological integrity of the Nation’s waters.” Early efforts under the legislation focused most strongly on improving systems for sewage treatment and controlling industrial pollution. Over time, the CWA has been amended to include provisions for development and certification of water quality standards (Section 303 and 401), the Nonpoint Source Management Program (Section 319), the Clean Lakes Program (Section 314) and development of total maximum daily load (TMDL) estimates for waters not meeting water quality standards (Section 303).

The Iowa Department of Soil Conservation (now Division of Soil Conservation) started receiving state appropriations in 1973 for conservation cost sharing to landowners through the Iowa Financial Incentives Program (IFIP), with annual funding typically about \$7.5 million.

**1980s**

The Food Security Act of 1985 ushered in new expectations for agricultural stewardship, with the beginning of Farm Bill conservation titles that included provisions that have become known as conservation compliance, sodbuster, swampbuster and the Conservation Reserve Program (CRP), under which more than 1.6 million acres in Iowa were enrolled for conservation purposes through summer 2000.

The Iowa Groundwater Protection Act of 1987 significantly increased the amount of information collected by the state on the quality of groundwater. Its many provisions

**II. BACKGROUND**

Watersheds are local. Each one is uniquely influenced by its geography, people, animals and “local capital,” which includes aspects of history and culture, businesses, governmental and educational institutions and volunteer leadership. Every building, every street and every farm field exists within a watershed, and every action has an impact on that watershed’s health and overall functioning in terms of water supply, flooding, water quality, soil fertility and wildlife abundance. Iowans can improve their environment and their economic livelihood by addressing these issues as a part of comprehensive watershed management.

Iowa has almost 72,000 miles of rivers and streams, and an estimated 209 square miles of lakes and reservoirs, 79 square miles of wetlands and 6 major groundwater aquifer systems (see Table II-1). Combined, these represent 420 watershed basins at the HUC-11 scale (see sidebar “What is a Watershed?” in this section). Within many of these watersheds, there is a strong history of work to solve problems like upland sheet and rill erosion, gullying, sedimentation of lakes and streams and flooding. More recently, water quality-oriented watershed projects have been organized to address threats to some of Iowans’ most beloved water bodies, and in other locations identified as high priority due to serious pollution concerns.

**Multi-Objective Needs**

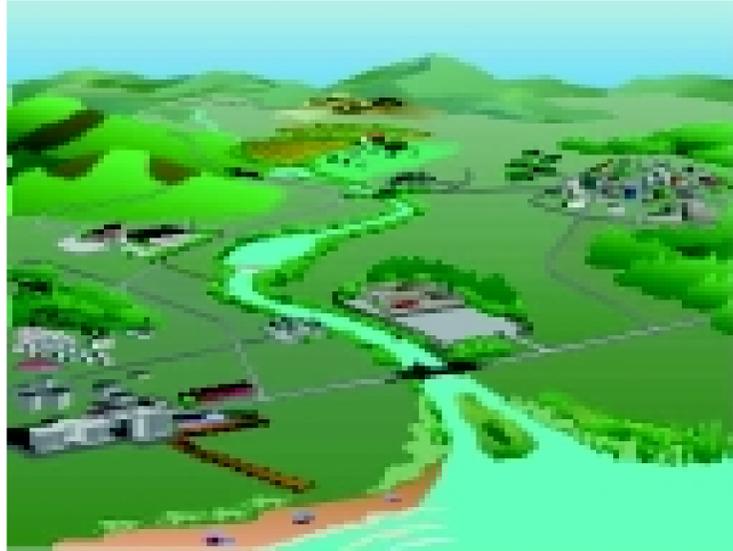
There has been recognition since the 1950s of the need for watershed projects to be comprehensive and coordinated, but in practice, traditional watershed programs often have focused narrowly. Time has shown that single purpose approaches may be successful in solving a specific problem, but they often fail to address the more subtle and chronic problems that contribute to a watershed’s decline. For example, pollution of a river from septic wastes might be reduced significantly after installation of a sewage treatment plant. However, the river still will not support intended uses if other problems in the watershed go unaddressed, such as habitat destruction, polluted runoff or commercial and residential development in the floodplain.

Unintended consequences can also be the result of single-purpose approaches, and there are many such examples in Iowa and elsewhere. One classic case that continues to plague area residents is along the Missouri River, where dam construction on the upper river and channelization of tributaries solved specific problems, but with unintended consequences. The combination of these alterations has drastically altered streambed elevations, and the rate of degradation of the river. The changes have resulted in a drastic increase in gully erosion throughout the entire watershed and serious threats to basic infrastructure such as bridges and roads.

Past watershed efforts have blended voluntary and regulatory approaches. Voluntary efforts have been relied upon to deal with nonpoint source polluted runoff, while regulations often have been applied to point sources. Both approaches will continue. Today, the public and landowners are taking issues related to water more seriously. Many are frustrated with problems that have seemed intractable. As a result, society is looking towards developing more aggressive water quality- and watershed-protection tools. These tools include better monitoring to get a more accurate view of problems, along with new enforcement strategies to use where serious problems are identified. Watershed-based initiatives can serve as a middle ground — a largely voluntary approach, tailored to local needs by local citizens, and in some cases, backed up by regulation.

*A multi-objective watershed-based approach to problem solving within watersheds does work in Iowa. The stories that begin on page 33 help make this case.*

A multi-objective watershed-based approach to problem solving within watersheds does work in Iowa. The case studies in this report help make this case. Agencies, organizations and jurisdictions can combine single purpose programs with the other concerns of watershed organizations to support planning and action for multiple objectives. To be successful in this, process is important. New skills and sensitivities may be needed to handle new ideas, personalities and technologies. Expertise in community organizing, facilitation and geographic information systems may be as useful as the ability to engineer a terrace or design a dam.



Source: U.S. Environmental Protection Agency

### What is a Watershed?

A watershed is the land area that drains to a waterbody. That landscape affects the waterbody's flow, water levels, water quality and natural diversity. In both a real and figurative sense, a lake or river, a wetland, a floodplain, a farm, a city and even human beings, are a reflection of their watershed and its health. Everyone has a stake in how water is used within watersheds.

Watersheds occur at multiple scales ranging from the largest river basins, such as the Mississippi River, to the watersheds of small streams or lakes that may measure only a few acres in size. A small watershed that nests inside of a larger watershed is sometimes referred to as a "sub-watershed." Because watersheds are defined by natural hydrology, they represent the most logical basis for managing water resources. The resource becomes the focal point to consider overall conditions in an area and the factors affecting those conditions.

The U.S. Geological Survey has developed a national hierarchical framework for identifying watersheds of different geographical scales. Each scale, or level, is designated using the hydrologic unit code (HUC) system. At the national level, this system involves an eight-digit code that identifies several levels of classification. Iowa has 56 HUC-8 level watersheds that range from 390 to 1,954 square miles in size. Within these HUC 8 watersheds are 420 smaller HUC 11 basins ranging from 62.5 to 390.6 square miles in size. Within the HUC 11s, at the local level where most watershed projects are organized, there are 1,400 HUC 14-sized subwatersheds that range from 15.6 to 62.5 square miles.

## Appendix 1: Watershed Events for Iowa and the Nation

### 1884

State drainage laws passed to establish drainage districts and levees to drain, straighten, widen, deepen or change any natural water course "whenever the action is of public utility or conducive to public health, convenience or welfare."

### 1908

Iowa constitution amended to promote drainage, allowing for condemnation and special assessments.

### 1930s

The Flood Control Act of 1936 introduced watersheds into the national vocabulary. The federal government recognized its role for flood control, splitting responsibility between the Department of Agriculture (to be in charge of upland treatment and flood control through small structures) and the Army Corps of Engineers (to take charge of "main stem" activity).

The Iowa Fish and Wildlife Trust Fund, derived from the sale of hunting, fishing and trapping licenses and other fees, was established in 1935 to help support conservation of wildlife and their habitats. In addition, the Federal Aid to Wildlife Restoration was passed by Congress in 1937, a precursor to the Federal Aid to Sportfish Restoration established in 1950. Combined, these programs, which produce up to \$29 million annually, have had significant impacts on Iowa's watersheds through maintenance and enhancement of the quality of habitat for fish and wildlife.

In 1939, the 48<sup>th</sup> Iowa General Assembly passed an enabling law to establish soil conservation districts, however with less authority to regulate land use than similar districts established nationally under the model recommended by the U.S. Department of Agriculture's Soil Conservation Service (SCS). The first Iowa soil conservation district was formed in Marion County in 1940, and by 1952 all of the state was covered by conservation districts. Today there are 100 soil and water conservation districts in Iowa, one in each county except Pottawattamie with two.

### 1940s

The development of watershed projects as a joint federal and state responsibility was recognized for the first time when Congress amended the Flood Control Act in 1944. The Act authorized development of 11 watershed efforts nationally, including the Little Sioux River Watershed in northwest Iowa, as part of the Public Law (P.L.) 534 Program.

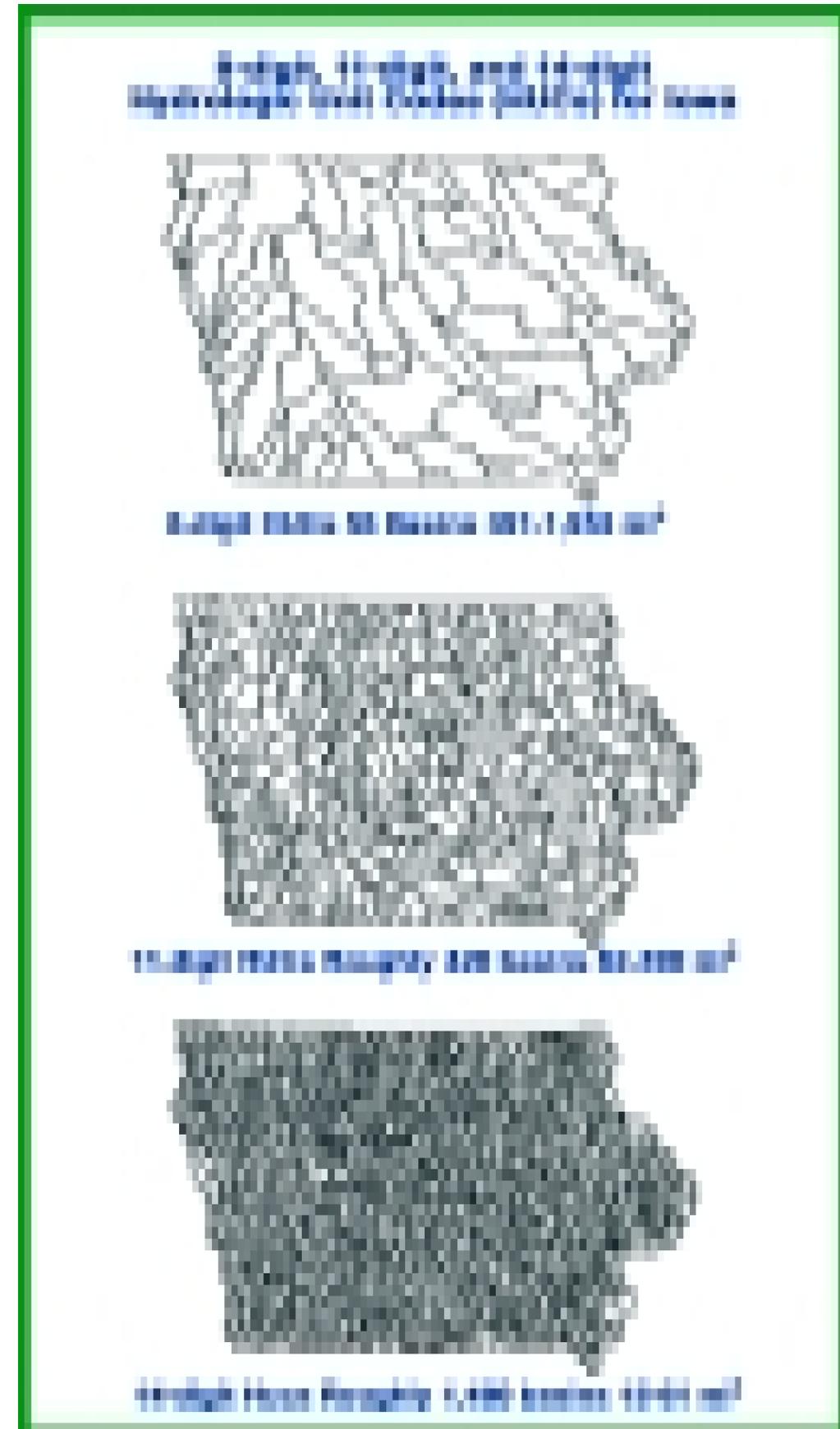
The 53<sup>rd</sup> General Assembly in Iowa enacted the Soil Conservation and Flood Control Districts Act, creating what become known as "conservancy districts" for soil conservation and control of floodwaters. One provision of the law provided that levee or drainage districts previously established could be combined with the new conservancy districts. It also established the Iowa Natural Resources Council with responsibility for "a comprehensive state-wide program for the conservation, development and use of the water resources of the state."



(Source: Natural Resources Conservation Service)

*Within many of Iowa's watersheds, there is a strong history of work to solve problems like erosion, gullying and sedimentation.*

Figure II-1.



Source: Iowa Department of Natural Resources

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 A P P E N D I C E S

Category	Category Described or Subdivided	Measure, Unit
Area of Iowa	Total Area	56,275 sq. mi.
	Land Area	55,965 sq. mi.
	Water Area	310 sq. mi.
Average Rainfall	Total Amount	32 in.
Average Evapotranspiration	Total Amount	26 in.
Average Direct Surface Runoff	Total Amount	3.5 in.
Average Groundwater Recharge	Total Amount	2.5 in.
Average Stream Discharge	Total Interior Stream Discharge	6 in. (18,000,000 ac ft/yr)
Rivers and Streams	Total Mileage	71,665 mi.
	Intermittent Streams	42,957 mi.
	Perennial Streams	26,630 mi.
	Ditches	1,418 mi.
	Border Rivers	660 mi.
Lakes	Total Area	145 sq. mi.
	No. of Significant Publicly Owned Lakes	115
Flood Control Reservoirs (4)	Total Area	64 sq. mi.
Wetlands	Total Area	70 sq. mi.

From State Nonpoint Source Management Program - Iowa. September, 2000. Iowa Department of Natural Resources, Des Moines, Iowa.

and/or residential development discouraged in those areas. Guidelines should be established by the statewide coordination body that include a reporting procedure.

4. Continue working to strengthen coordination between planning efforts in the areas of hazard mitigation, economic development and watershed protection.

### **Goal: Encourage Citizen Involvement**

#### *Recommendations*

1. Initiate a public outreach and marketing campaign to build on existing and past efforts to increase awareness and appreciation of watershed issues. Work closely with local and regional watershed leaders to develop.
2. Continue to encourage involvement by diverse stakeholders in developing and leading watershed projects. Include nonprofit organizations, commercial interests and interested individuals, along with representatives of state, local and/or federal agencies. Where appropriate, provide financial assistance to bring in neutral facilitators skilled in community development to help build capacity for citizen leadership and decision-making. Also, provide additional training for state and local agency staff in working effectively with the public and encouraging citizen participation.
3. Support education efforts with youth and adults that heighten awareness, develop understanding and support local engagement on watershed issues. Effective programs to support include the Iowa Envirothon and aquatic education programs for youth, and the Farm\*A\*Syst, IOWATER citizen water quality monitoring and Adopt-a-Stream programs that primarily involve adults.
4. Increase the emphasis on addressing local social and economic issues in watershed programs.

## **III. ISSUES AND NEEDS**

Iowa's citizens want and deserve a landscape that is inviting, productive and safe. They want clean waters, clean air, high quality recreation spots and conditions that allow an array of plants and animals to live and thrive. Iowa's landowners want to maintain their homes and properties. They need to minimize flood damage and want timely assistance when floods occur. Farm producers and commercial businesses want to be able to make a living, and they deserve regulations that are clear and reasonable.

According to the many Iowans who contributed to the recent *Iowa 2010* plan, caring for the natural environment is important economically and culturally to the state. For example, *Iowa 2010* identifies the value of enhancing and maintaining nature trails, state parks, preserves, prairies, wildlife management areas and forests to attract those who are considering the state as a place to work and live.

The following major areas represent problems and opportunities for Iowa's watersheds today:

- Social and economic issues;
- Flood-related issues, including dam safety, rehabilitation and construction;
- Water quality and supply issues;
- Soil quality issues;
- Ecosystem management issues, including wildlife habitat and biodiversity;
- Outdoor recreation, aesthetics, and historic and cultural resource issues;
- Climate and precipitation change issues; and
- Drainage infrastructure issues.

These issue areas were studied and discussed by the Iowa Watershed Task Force and under each, specific needs identified. These needs served as the starting place for the final recommendations that come in Section V. The issues and needs are not meant to provide an exhaustive list of problems or solutions. Instead, they are meant to highlight the topics that the Steering Committee and workgroups concluded are the most critical, overall issues for Iowa watersheds today and in the near future.

These issues and needs will not all exist in every watershed and some will be more prevalent at a particular time or season. However, as the saying goes, "everything is connected." While one topic may receive the focus at a particular time, a variety of concerns usually need to be considered together to effectively solve problems.

### **Social and Economic Issues**

Social and cultural factors underlie our challenges and solutions. Economic conditions for individuals, families, businesses and even for government agencies, influence society's focus and help determine priorities. It is important to remember that poor watershed management can lead to poor economic conditions. A few illustrations of the negative economic impact of poor watershed management are unpleasant water bodies that no longer attract tourist dollars; property destruction where urban sprawl and development of prime farmland causes increased runoff and downstream flooding; and eroding croplands, which cause siltation of lakes and streams while reducing the productivity of the land.

Leadership is necessary to avoid these types of problems, and to fix them where they have already occurred. Leadership is needed that is visionary and inclusive, bringing citizens of a

community together to establish common goals and devise solutions. Iowa's history with watershed management projects makes it clear that successful efforts require leadership. This includes the active support of local citizens who care about improving their lands and waters, who are willing to build community support and who are assisted by government. A major challenge is learning how best to interest, educate, create concern and motivate citizens so that they will take action. Another challenge is learning how the government can best provide citizens with the support they need, including financial and/or technical support.

#### Needs

1. Increased emphasis on local social issues in addressing watershed protection and improvement programs. Community development assistance should be incorporated into programs, where appropriate, to build capacity for citizen leadership and decision-making in meeting watershed challenges and opportunities.
2. Additional resources that agency staff and/or local residents can draw upon to outline basic economic costs and benefits of their decisions. Although environmental costs can be difficult to quantify, they should be acknowledged. When possible, economic assessments should be comprehensive, including the costs and benefits that will be incurred if nothing is done or if there are alterations to the environment.

#### Flood Related Issues, including Dam Safety, Rehabilitation and Construction

Iowa is susceptible to flooding. State residents are frequently surprised to learn that their state has the distinction of being reported to Congress as "the most flood damaged state" in the United States during the decade between 1989-1999, according to the joint interagency flood damage reports compiled by the U.S. Army Corps of

... "the most flood damaged state" in the United States during the decade between 1989-1999, according to Federal interagency flood damage reports.

Engineers and the National Weather Service. The 1990s have included 13 federal disaster declarations for flooding. All of Iowa's 99 counties have been flooded to the extent that full recovery was beyond the capability of local and state government. Recent flooding has repeatedly impacted areas or regions in Iowa with little or no history of flood damage, and has caused hundreds of millions of dollars in damages to agriculture, public infrastructure, public facilities, businesses and residential property.



Source: Iowa Emergency Management Division

Iowa is susceptible to flooding.

*Communities like Independence and Cherokee are finding that alternative, less-developed uses in critical areas can provide hazard mitigation, increased recreational opportunities and improved water quality.*

legislative requirements to provide credible data (see discussion in Section IV: Essential Tools for Watersheds).

5. Continue funding for GIS programs, as described by the Iowa Water Quality Initiative, and insure that local watershed organizations have free access and training to use computerized landscape information managed by the IDNR, the Iowa Geographic Information Council and other entities. Adequate staffing is critical to help people who do not have GIS technical resources or staff capacity. Establish a repository for GIS data produced for completed and on-going watershed projects, and link to the watershed clearinghouse.
6. Develop a sustainable, smart growth development initiative to address watershed goals, or consider expanding existing efforts like IDNR's "Rebuild Iowa" program that currently works with local communities primarily to address energy efficiency issues.

#### Goal: Build Local Capacity for Watershed Initiatives

##### Recommendations

1. Encourage and assist development of local watershed councils by providing state support and technical assistance. Local soil and water conservation districts will be the focal point for assistance, providing leadership and a point of contact for local watershed initiatives.
2. Revise current state watershed grant program guidelines to better support local watershed-oriented planning and implementation initiatives. Provide structure while allowing flexibility. Establish an ad-hoc committee that includes local watershed project coordinators to review procedures and consider items such as development of standard evaluation format and/or procedures that will provide a "base" set of reporting requirements to reduce paperwork, improve consistency and allow more effective quantification of results and comparisons between projects.
3. Increase the emphasis on watershed planning in grant programs. Make resources available to build local capacity in communities or regions for planning-related activities, such as problem assessment, outreach and group facilitation. Groups may also benefit from legal assistance to utilize opportunities for organizing under existing "subdistrict" legislation that applies to lake and water districts, sanitary districts or soil and water conservation districts.

#### Goal: Emphasize the Role of Watershed Efforts in Flood Hazard Mitigation

##### Recommendations

1. Work cooperatively with all levels of government to fund development and periodic updating of a system of floodplain mapping that is standardized and available on geographic information systems so that information on flood hazards is available in every community.
2. Fund increased floodplain education for local governments. Provide incentives for county government to better enforce existing floodplain laws and to develop tighter restrictions on new development in floodplain areas that are particularly hazard-prone.
3. Strengthen procedures for conducting environmental review of economic development funding when projects are proposed in flood-prone areas. Appropriate, low-impact development should be encouraged, and commercial

management issues, identification of drinking water sources, existing water resource management practices and costs of estimated remediation practices.

### Goal: Increase State Support for Watershed Protection

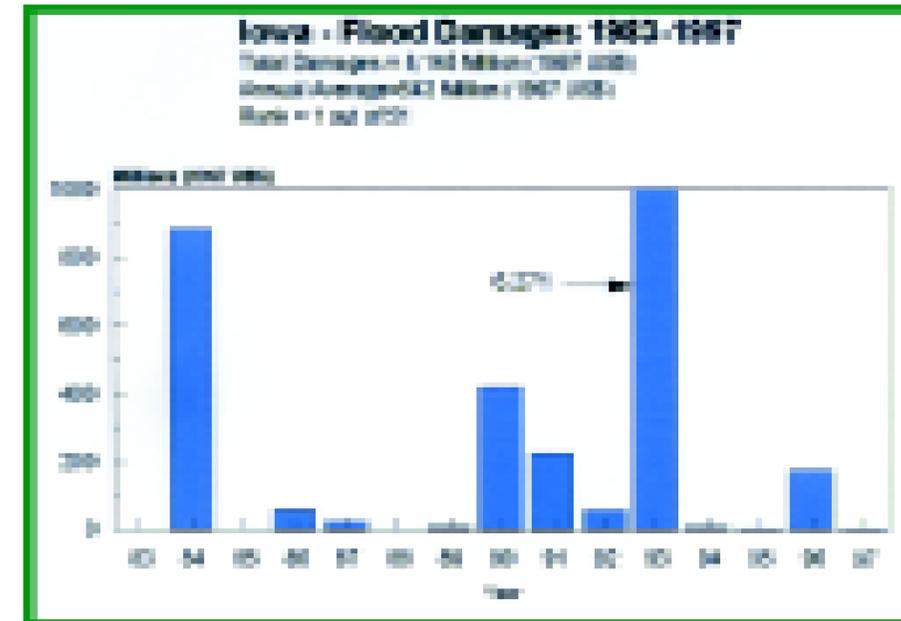
#### Recommendations

1. Establish a legislative study committee to explore in more detail the specific needs for financial support for watershed-related programs and sources of funding that could be utilized beyond the state's General Fund. Higher levels of funding for water-related programs are critical to achieve the basic goals identified in this Task Force report, and to take better advantage of opportunities to leverage funds available from federal and other sources. Creative options that should be considered include additional mechanisms to charge fees based on polluting products or activities, credit trading, a usage-based tax added to water and sewer bills, a fraction of a percentage sales tax such as in Missouri, or a low-interest revolving loan fund similar to the Clean Water Act State Revolving Fund that is now used for sewer infrastructure projects.
2. Encourage state agencies with responsibilities for programs that impact the landscape, including the departments of transportation and economic development, to provide more active leadership and accountability in conducting programs consistent with principles of sound watershed and floodplain management. Positive examples at the state level will set the stage for positive actions by local governments and individuals. First steps should be to assist staff with additional training and to review laws and authorities that relate to watershed and floodplain management activities, identifying needed readjustments or changes so that watersheds become a primary organizational focus for doing business rather than an add-on issue.
3. Establish an ongoing, staffed watershed clearinghouse for data and grant information. All government programs that fall under the umbrella of watershed management would provide detailed project information to the clearinghouse, based on an established, consistent format (see Appendix 4: Program Description Template for a Watershed Clearinghouse). The recommended location for the clearinghouse would be Iowa State University Extension, based on the model of the Missouri Watershed Information Network.

*Practical tools for regional and local contacts and groups could include information such as:*

- GIS maps of watershed units at different hydrologic scales
  - Model of assessment, planning and evaluation worksheets
  - Examples of watershed action plans from Iowa or the region
  - Models for convening a group of representative stakeholders, with examples of different types of facilitation and surveys for landowner and residents
  - Template news releases for publicity
  - Data on water quality and quantity, and other issues identified by state coordination group
  - Lists of technical and financial assistance for watershed efforts
4. Support the statewide water quality monitoring plan, developed by the Iowa Department of Natural Resources (IDNR), with additional resources to move forward to finalize the plan and achieve priority goals, including meeting

Figure III-1.



Source: U.S. Army Corps of Engineers

There are complex reasons for these damages, but they indicate that Iowa needs to do more to protect human life and property, as well as stream, wetland and floodplain habitats. Fortunately these needs are highly complementary since optimal ways to prevent flood damage include actions that preserve and restore stream, wetland and floodplain habitats.

Channelization of streams in rural areas, and urban and suburban development in floodways and floodplains, exacerbate flooding problems and increase hazards to life and property. In some cases, the problems may be due to a need for better information about flood risks and the downstream flooding impacts of upstream land use changes. Land use changes that contribute to flooding include developing and paving lands, draining wetlands, modifying streams and even constructing certain flood control structures. Problems are more likely to happen if there are not adequate local ordinances that prevent unwise development, or if ordinances that do exist are not enforced.

Better information is critical: in major portions of Iowa, floodplain maps are either incomplete or need to be updated. After the 1993 floods, the Federal Emergency Management Agency produced accurate digital 100-year floodplain maps of eight Iowa counties. Paper maps for floodplains exist in another 52 counties, yet 34 counties still do not have floodplain maps. Developing accurate, up-to-date GIS data for floodplain boundaries is costly, however state and local watershed managers are severely limited when such vital information is incomplete or unavailable. Even when information is available, people often choose actions that pose risks to themselves or others. Such choices may be encouraged by taxpayer-supported insurance and disaster programs that assume part of the risk of building in flood-prone areas.

In the last few years, Iowa leaders have recognized these problems and have been more actively seeking to integrate planning efforts and programs that address flood hazard mitigation with those that address watershed management. Integration is vital to reduce loss of life, property damage and the taxpayer burden for development in areas that flood repeatedly. Integration will also benefit floodplains, which are critical areas for many aspects of natural resource management. Communities like Independence and Cherokee are finding that alternative, less-developed uses in critical areas can provide hazard mitigation, increased recreational opportunities and improved water quality.

In addition, the construction of dams and their long-term safety and maintenance need to be carefully considered as part of flood hazard mitigation and watershed management. Iowa has 3,069 structures on its dam inventory, with 229 structures classified as “major” and 2,840 as “non-major.” About 2.4 percent are classified as high hazard dams, 5.6 percent are classified as moderate hazard structures and the rest have a low hazard classification. The condition of these low hazard dams is largely unknown, but many are reaching the end of their design life, an assessment determined by the relative size of the watershed, upland watershed practices and the maintenance history of the structure.



Source: Iowa Department of Natural Resources

*Runoff and erosion degrades water quality and can also threaten infrastructure, such as bridges.*

Iowa does not have any comprehensive inventory of dam safety needs, due to a long-term lack of adequate dam safety funding. Based on experience in other states, it can be assumed that many of the dams are in need of maintenance, repair or rehabilitation for items such as deterioration of structural spillways and impoundments filling in with sediment. Many low and moderate hazard dam structures have been built. They are so named because, when constructed, there was little valuable downstream property at risk for flooding, and the cost to the landowner or the taxpayer was far less than if the dam were built to a higher design standard. Unfortunately, houses, businesses and other development have sometimes been built downstream of dams – even in areas where easements were supposed to prevent development — thus increasing risks of property damage and/or loss of life in the event of a dam failure. When downstream development occurs, the hazard classification could change and substantial modifications to upgrade the dam may be required.

### Needs

1. Further coordination among federal, state and local agencies to integrate floodplain management, flood hazard mitigation, watershed protection and economic development.
2. Additional outreach and technical assistance to assist local governments, including education on tools to encourage low-intensity uses of floodplains, such as for recreation and environmental education, especially for areas downstream of dams.
3. Additional staff to inventory and maintain records on the status of dams in the state, especially high and moderate hazard structures, and to provide expanded technical assistance to local decision makers to plan for maintenance, redesign and/or reconstruction, or removal of older dams.
4. Continued support for programs that encourage landowners to apply upland conservation treatments that reduce runoff, such as the USDA Environmental Quality Incentives Program (EQIP) and the IDALS-DSC programs for cost-share and watershed project implementation.
5. Expanded programs that provide incentives and technical assistance for urban soil and water conservation and stormwater management programs.
6. Continued support for programs that offer landowners incentives to restore wetlands and riparian areas, such as the FEMA and USDA floodplain buyout programs.

## VI. GOALS AND RECOMMENDATIONS

Presently, many projects are driven by crisis — a flood occurs, a well is polluted or a beach is closed. To some extent this is unavoidable, since crises will happen. However, a stronger emphasis on preventing water-related problems and disasters would be beneficial in many ways. It can save financial resources, reduce environmental damage and human stress, and sometimes even save lives. The Iowa Watershed Task Force encourages the State of Iowa to continue and build upon previous steps to develop a more pro-active watershed framework for Iowa.

This framework emphasizes locally driven strategies, multi-objective approaches and the need for stronger state-level support, as identified in the previous sections of this report. If these measures are adopted, they will improve the coordination and integration of existing programs, expand education and training on watershed issues, and ease access to available resources and services.

See the *Guiding Principles for an Iowa Watershed Framework*, outlined in Section I Executive Summary, which set the stage for the discussion in this report. The Goals that follow are adapted from language in the original legislation establishing the Iowa Watershed Task Force. They are used here as the basis for organizing the Recommendations of the Task Force. Together, these Principles and Goals will serve as a future measure of the state’s progress in accomplishing its watershed responsibilities.

### Goal: Develop a Framework for Enhanced Cooperation and Coordination

#### Recommendations

1. Establish an on-going coordinating body to continue to address the watershed issues identified by this task force. Include similar representation from state, federal, and local agencies, nonprofits and commercial interests, as on the Watershed Task Force. Create a “home” for coordinating entity within the Iowa Department of Agriculture and Land Stewardship – Division of Soil Conservation.

Specific services and/or functions provided by the water resources coordination body will include:

- serving as a liaison and point of contact on watershed issues with key resource and service providers linking state and federal agencies with local watershed interests;
  - facilitating the connection and integration of programs/strategies currently done independently (example: wellhead protection and hazard mitigation);
  - collaborating on opportunities for watershed-related training, development of a watershed clearinghouse of information and resources and development of Geographic Information System resources;
  - building consensus on watershed issues among state, federal and local authorities; and
  - developing an annual update on watershed programs, reporting on the progress to address the recommendations in this Watershed Task Force and other priorities established by the coordinating body.
2. Conduct a statewide needs assessment, in cooperation with appropriate local and federal entities, to identify and quantify water resource problems and funding needs. Parameters for the inventory will include: land use, water uses, population, major point and non-point sources of pollutants, floodplain

## Transportation Agency Looks for opportunities to help in Watersheds.



Source: Iowa Department of Transportation

*Restored stream channel, following grading, at the City of Dike Mitigation Area.*

Highways and roads criss-cross every watershed in the state, and their upkeep and construction can pose problems – from paving over sensitive natural or cultural resources, to affecting hydrology, to causing water pollution from fuels and road salt. The Iowa Department of Transportation (DOT) and its partners deal with these challenges on a regular basis. The agency has been working more proactively in recent years to prevent and address such problems, and even to find ways that highway improvement projects can serve a dual purpose to help with watershed management objectives.

A recent example is near the City of Dike in Grundy County. A site to

excavate soil was needed for soil for construction of U.S. Highway 20. At the same time, city leaders were looking for possible solutions to help ease minor flooding that occurs in their community. Working together, the DOT was able to find a borrow site that fit the needs of highway construction and also provided some flood storage capacity. The site was designed to further include a stream restoration and wetlands for mitigation. The end product is a new water recreation area for the city.

On other projects, the DOT has raised the inlet side of culverts to create wetlands and/ or silt basins which slow water and allow silt and other pollutants to settle out rather than be carried downstream. The DOT has also installed structures to stop the degradation of streambeds to protect highway bridges and culverts upstream. When the DOT has needed to provide mitigation for impacts to wetlands and waters of the U.S. by highway projects, local watershed managers have worked with the agency to search for mitigation opportunities that can accomplish both the required mitigation purpose as well as other watershed objectives.

7. Higher standards for upland land conservation treatments in the watershed above dams if public funds will be used in the creation or maintenance of a dam.
8. Stronger enforcement of easements that limit development in areas downstream of dams, especially those classified as low to moderate hazards, since these classifications allow the dams to be constructed with lower safety requirements than high hazard structures.
9. Consideration of additional requirements that dam owners hold appropriate insurance or post bonds in case of problems.

## Water Quality and Supply Issues

Many Iowa streams are named for properties they possessed 150 years ago – Clear Creek, Crystal Creek – but few today would inspire such names. Many of Iowa's water bodies are cloudy and silt-choked, supporting few of the native plants and animals that once thrived there.

The final Iowa 1998 Impaired Waters List, agreed to by the State of Iowa and U.S. Environmental Protection Agency, identifies 157 water bodies that do not meet state water quality standards for their designated uses. These pollution problems need to be addressed, yet there are additional water quality problems in the state that are not represented on any official list. Threats to waters that are still considered to be of good or high quality are also of concern, and it is often these areas where local citizens are most involved and interested. In addition, the impaired waters list does not directly address threats to groundwater.

According to the state's most recent Nonpoint Source Management Plan (IDNR 2000), nonpoint source pollution is Iowa's greatest water quality challenge. More than 80 percent of the state is devoted to agricultural production, and agriculture is the primary source of nonpoint pollution. Other sources include urban construction sites, forestlands and eroding streambanks, as well as pet wastes, faulty septic systems and even atmospheric deposition. Land use changes fueled by haphazard urban growth patterns, often encouraged in the name of economic development, frequently neglect adequate consideration of their impact on water quality.



Source: Iowa Department of Natural Resources

*Erosion from construction sites in urban and suburban areas can be a serious water quality problem.*



Source: Iowa Department of Natural Resources

*Livestock wastes can be a source of bacteria in waterways.*

Iowa's 1998 305(b) Water Quality Report report notes that traditional point source pollution associated with heavy industrialization, such as toxic metals, was low during the 1994 to 1997 reporting period. Even so, point source pollution is a significant problem for many Iowa water bodies and will continue. Point sources are permitted under the National Pollutant Discharge Elimination System, which apply to industrial effluents, sewage plants and large livestock facilities. Permits are designed to protect water bodies, based on the water body's use designation and the water quality standards that apply to its designation. However, permit limits are often based on "dilution," rather than reduction or elimination of a pollutant. Controversies continue over the effectiveness of permit limits in many cases. In addition, a large number of the state's approximately 1,700 NPDES permits have expired and need to be updated.

Sediment from nonpoint sources is Iowa's top water concern. It comes from farm fields, construction sites, yards, overgrazed pastures and woodlands. Much of this sediment is rich, prairie-based soil that is economically valuable when it remains on the land, but a liability when it reaches the state's lakes, streams and wetlands. Farmers in Iowa have cut the soil erosion rates from cropland and pastures by an estimated 50 percent since 1982. They also lead the nation in establishing conservation buffers to protect waterways and in the number of wetlands they have restored through programs like USDA's Wetlands Reserve Program (WRP). These improvements are impressive, showing what can be accomplished. Work is ongoing to maintain this effort and increase progress, for example to address the estimated 16 percent of Iowa's agricultural land that is still eroding at rates greater than twice the tolerable soil loss rate.



Source: Iowa Department of Natural Resources

*Using streams and sinkholes as trash dumps is unsightly and a pollution track.*

organisms may come from livestock wastes, inadequate home septic systems and community sanitary sewers, food processing and even from pets and wildlife. Many healthy adults can survive an encounter with these pathogens; however exposure may be life threatening, especially to the young, to the elderly or to those with suppressed immune systems. Pharmaceutical residues are another lurking water-related health threat that is just being identified. Most wastewater treatment plants are not set up to treat nor to monitor residues of drugs, such as antibiotics, which come from widespread use for humans and also from modern livestock production practices.

Pollutants, however, are not the only threat to water quality. Many of Iowa's water bodies suffer physical damage due to channelization, drainage and other activities that have dramatically altered stream-flow patterns. When Iowa was largely prairies and wetlands, the land absorbed tremendous amounts of water and released it slowly to streams that were often shallow and ran clear with rocky bottoms. Today, many streams have disappeared completely and new ones appeared where they did not historically exist. They flood more often, the fast water cutting into streambeds and scouring banks and bottoms. Then in dry weather, they often become completely dry, leaving no habitat for fish or other aquatic species. Improved watershed management can reduce flood peaks by storing water on the land and releasing it more slowly so streams maintain flow and provide suitable habitat for aquatic life.

An adequate supply of potable, usable water is critical to a sustainable economy. At present, during normal rainfall conditions, Iowa has excellent supplies of high quality water from groundwater and surface waters. With careful planning and renewed action, Iowa can preserve those supplies and prevent expensive or irreversible pollution of them. If not, future generations of state residents may face unpleasant challenges similar to water-scarce regions, where questionable development and lack of attention to conservation require that water supplies be pumped from diminishing aquifers or piped from far distances.

Excess nitrogen and phosphorus still damage Iowa's streams and lakes, and the impacts are thought to reach downstream all the way to the Gulf of Mexico. These nutrients come from chemical and organic fertilizer applications to farm fields and urban properties, and also from natural mineralization of organic soils. Prevention is complex and requires a mix of approaches, including better fertilizer and soil quality management and landscape buffers of wetlands, trees and prairie grasses restored to filter drainage and runoff.

Bacteria and viruses are also a threat to Iowa's waters. These are among the most serious threats from a human health standpoint. These

## Restoration Success Measured in Visitors and Dollars



Source: Iowa Department of Natural Resources

*Lake Ahquabi is now a popular destination for anglers of all ages.*

You can calculate the results of restoration work at Lake Ahquabi in terms of tons of pollutants that are no longer entering the lake. Success, however, may be better measured in terms of people and dollars.

This 125-acre lake, located in a 770-acre park in Warren County was built in 1935 by the Civilian Conservation Corps. Like so many lakes constructed at the time, there was little consideration for the impacts of changes related to agriculture and development, or for the maintenance needs these changes would generate. By the 1980s, water quality suffered from sedimentation and nutrient over-enrichment, and the lake was in danger of eventually disappearing.

To counteract the damage, a restoration project was initiated in the mid-1990s, dramatically improving the lake and park. The project was part of the Clean Lakes Program, funded in part by U. S. EPA. The program focused on improving lake water quality, addressing in-lake and watershed issues. The federal program was only funded through 1995, but Iowa has continued the program and funded it from a variety of other sources.

"The results at Ahquabi are night and day," says Al Farris, an Indianola resident who is also administrator of the Fish and Wildlife Division of the Iowa Department of Natural Resources. Farris has fished at the lake since he moved to the area in 1976. "Before the restoration, there were not many fish. Those that were there were small and often stunted, and the water was dark and cloudy," he relates. "But it's great now. The last time I went with my two young grandsons, we were catching fish constantly."

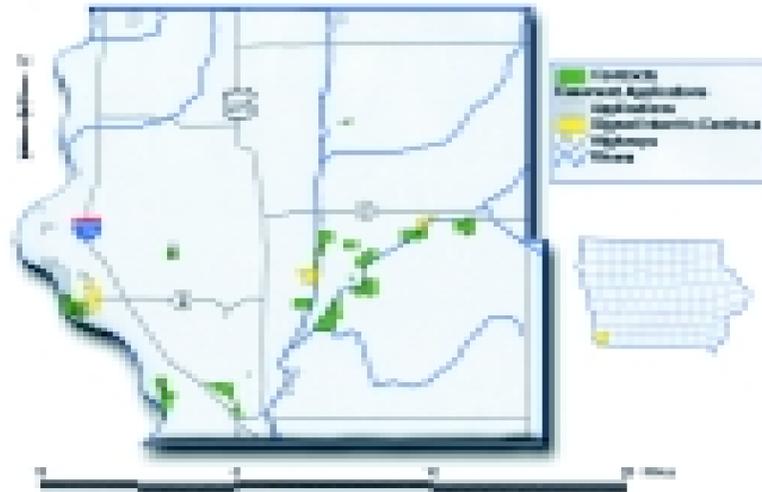
To achieve such success at Lake Ahquabi required an investment of almost \$4 million. It is estimated, however, that the "pay back" happened in only two years. This is based on accepted economic calculations from studies that show an average visitor to a state park spends about \$20 a day. Park usage at Ahquabi has more than tripled after the work was completed, going up to an estimated 350,000 visitor days per year in 2000.

Other lakes that have benefited from the state's comprehensive lake restoration efforts include Lake Manawa, Blue Lake, Green Valley Lake, Union Grove Lake, Swan Lake, Five Island Lake, Black Hawk Lake and Upper and Lower Pine Lakes. In addition, restoration work is underway at Little Wall Lake and Storm Lake and plans are being completed for improvements to Clear Lake, Lake of Three Fires, Rock Creek Lake, Crystal Lake and Silver Lake.

According to Farris, the program has been very popular and successful because of local interest. "Local support," he says, "is what generates the partnerships needed to plan, fund and complete restoration work."

## Fremont County Uses GIS to Assist in Watershed Efforts

Fremont County is located where the Nishnabotna River flows into the Missouri River, in Iowa's southwestern corner. The county has been heavily impacted by regular floods, which have been more frequent in recent decades. After another inundation in 1998, local landowners and drainage districts, working with the Natural Resources Conservation Service (NRCS) and Soil and Water Conservation District, decided to make some changes.



Source: Natural Resources Conservation Service

They initiated a major planning and wetland restoration effort that has several goals. These goals include taking flood prone lands out of production, improving the water-holding capacity of the watershed and reducing pressure on local drainage systems. Since the area is near the major metropolitan area of Omaha, there is also potential for the project to provide local economic diversification from increased tourism and hunting. Relatively new Geographic Information System (GIS) technology is helping to track the problems, document progress and explain the implications of the changes. All of the office's technical staff have been equipped with GIS equipment and training to use it.

Making the best use of the technology is an evolving process, according to Christie McKinley, Fremont County NRCS District Conservationist. Fremont County started out with a GIS analysis of the impact of the '93 floods on levee breaks, to see where the worst crisis areas existed. These lands were identified as prime spots for recruiting interested landowners. "The GIS was a great tool to target areas," says McKinley, "but unfortunately, we haven't had enough program funding to make the best use of the information - we already have a waiting list of landowners, so we haven't really had to do much recruiting."

The county has succeeded in bringing in about 6,200 acres into easements in two-years time, but the need "is so much more than that," says McKinley. "Even so, we've used GIS to track progress and see where gaps are. It is visual," she explains, "which really helps when we are going out to the community to share information or to funders to explain our needs looking at the whole watershed."

Fremont County is starting a new watershed project, Plum Creek, for which they just received a Watershed Protection Fund development grant from the Iowa Department of Agriculture and Land Stewardship - Division of Soil Conservation. McKinley says the Plum Creek project is a good example of a more advanced stage of using GIS. "Here, we are using GIS-based information on soils, flood damages, landuse, etc., to analyze the most effective placement of small flood control structures on private land. This kind of planning will help us make the best use of the limited funding that's out there to make a difference for reducing floods and protecting water quality."

Increasingly, Iowa is under pressure to meet the goals of the Clean Water Act (first passed almost 30 years ago), the Safe Drinking Water Act and other state and federal laws. Failure to meet legal obligations can have serious economic consequences for businesses and taxpayers. Iowa is making progress towards setting higher goals aimed at protecting and restoring the quality of all of its water bodies. To do so will take time, money, effort and commitment, since the changes to these waters have been happening for more than a century.

### Needs

1. Continued improvements in enforcing existing water quality-related laws, and adequate funding to support regulatory programs so that water quality can be protected, the state's backlog of NPDES permits can be reduced and permit applicants can receive timely assistance.
2. Integration of impaired water determinations along with other important watershed considerations, such as recreation values and the need to "keep high quality waters clean," as prioritization occurs for water-related programs.
3. Targeting of cost-share funds to most effectively assist Iowa landowners in implementing soil erosion control and other water quality protection practices.
4. Expansion of incentive programs and enforcement of existing laws related to septic and sewer systems to assure that all communities and developments have adequate waste disposal systems.
5. Additional technical assistance and funding for communities to develop and implement watershed management plans, including source water and wellhead protection plans.
6. Continued refinement and research of conservation technologies and best management practices (BMPs), and incentives to encourage landowners to utilize the best technologies and practices, especially in priority watersheds.
7. Attention to sustainable development approaches that balance needs for jobs and amenities with water quality protection and other watershed considerations locally and downstream.
8. Review of progress in implementing the statewide water study done in 1996 by the Midwest Assistance Program, and updating if necessary.
9. Consideration of the type of information that water quality projects and grant programs most need to provide so that basic reporting requirements are reasonable, standardized and effective in providing information that can indicate trends and progress.
10. Revised farm commodity programs that better address conservation objectives.
11. Stronger emphasis on water conservation, using education and demonstration.
12. Additional attention to reducing nonpoint source water pollution problems in those cases where identified "bad actors" have had generous time and access to cost-share and technical assistance to curtail major pollution sources on their property.

### Soil Quality Issues

Since settlement, Iowa has lost half of its organically rich topsoil, the deep prairie soils that took thousands of years to develop. Depleted soils are not as productive, and over time their ability to produce crops becomes more and more dependent on artificial inputs.

There are many practices that improve soil quality and reduce erosion. Using conservation tillage and planting cover crops improve soil tilth and provide carbon storage to mitigate the potential for global warming. Improved soil tilth brings many watershed benefits, including reduced water runoff and increased filtration, reduced soil erosion and siltation of water bodies, and increased groundwater recharge that contributes to base flows in streams, lakes and wetlands.

#### Needs

1. Additional expertise on soil quality issues on watershed advisory groups.
2. Increased incentives that make soil-building best management practices (BMPs) more attractive to landowners, especially in priority watersheds.

#### Ecosystem Management Issues, Including Wildlife Habitat and Biodiversity

Iowans have altered a high percentage of their landscape. Millions of acres of tallgrass prairie and wetlands are now row crops, roads and cities. Less than 2 percent of Iowa's prairies and 5-10 percent of its wetlands remain. While these changes have brought many benefits, their impacts include lakes filled with silt and algae, muddy streams and diminishing diversity of



Source: Natural Resources Conservation Service

Habitat for ducks and geese on a restored wetland in Van Buren County, Iowa.

plant and animal life. In addition, Iowa's landscape continues to endure ever-increasing assault by an expanding array of invasive pest and foreign species. Species of concern include zebra mussels and Eurasian water milfoil that choke and clog waterways, and purple loosestrife and reed canary grass that crowd out more biologically valuable native wetland plants.

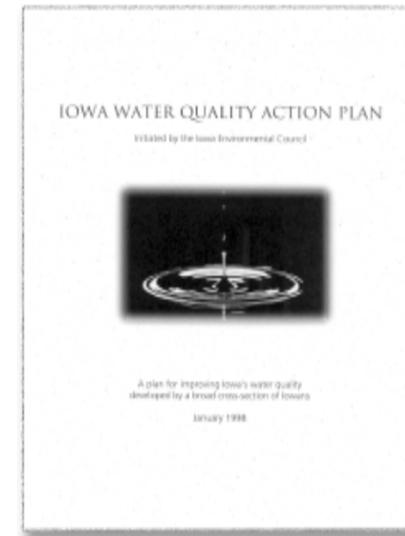
Iowans are responding to these ecosystem threats, but the challenges are great, requiring both protection and restoration strategies. Based on percentage of land area, Iowa has only a small amount of land that can be considered "wild." Such land is increasingly valued for its scientific and recreational value, and should be carefully considered in the context of watershed programs. However,

Iowa can't depend on protection – too many pieces of our native heritage have been lost. Thus, restoration is vital, and Iowa is becoming a leader nationally in restoring lakes, wetlands and prairie habitats. Many large and small examples of ecosystem restoration projects can be found in watersheds across the state, ranging from the successful reintroduction of wild turkeys and river otters to brown trout naturally reproducing again in coldwater streams in northeast Iowa.

Many opportunities exist for restoring pieces of the landscape in strategic areas that can provide needed ecological functions, even if they are not necessarily faithful restorations of the original ecosystem and its biodiversity. Buffer strips of permanent vegetation are one good example. When well designed, they can provide diverse habitat for an array of wildlife and prevent sediment, nitrogen, phosphorus, pathogens and pesticides from entering streams and lakes, thus improving water quality and in-stream habitat. The buffer strips also stabilize stream banks, soak up runoff during periods of high rainfall, sustain stream flow between rains and reduce water temperature, thus increasing the water's ability to carry the oxygen necessary for aquatic life.

## Water Action Plan Sets Stage for Ongoing Change

Concern over water brought more than 200 Iowans together in November 1997, culminating a year's efforts to develop consensus recommendations. The result was the Iowa Water Quality Action Plan, published by the Iowa Environmental Council (IEC).



The Iowa Water Quality Action Plan reflects the consensus and commitment of more than 200 Iowans.

The process started when 75 organizations in the State came together to support the Year of Water, initiated by the Leopold Center for Sustainable Agriculture. At the same time, the Council began to identify policies and programs needed to protect Iowa's water quality. In several working groups, the Council brought together a broad cross-section of Iowans, including policy makers, scientists, farmers, conservationists, educators, business people, state agency experts, and the general public to identify water quality issues for the state and to offer potential solutions.

Three years later, it's become clear how important it was to have Iowans come together to adopt this blueprint for change. An exciting array of activity is happening that tracks the Action Plan's general themes. Better research information will be coming, especially as Iowa implements a comprehensive monitoring network. Local people are working on local solutions, through efforts

such as with watershed planning. Iowa's policy makers are showing stronger leadership in working for Iowa's water quality. And with the passage of the \$11.2 million Water Quality Initiative during the 2000 Legislative session, progress was made toward the Action Plan's goal of sustained long-term funding for water quality protection.

"Together, the diverse interests that developed the Iowa Water Quality Action Plan have demonstrated the power of the people to increase the prominence of an issue and to set the stage for action," says scientist and writer Dennis Keeney, who was director of the Leopold Center and also IEC's vice president at the time. According to Keeney, "Since the plan was developed we have seen stronger political leadership on these issues. We are also seeing better research information, and more people involved in developing local solutions through efforts such as volunteer monitoring that build an informed, aware citizenry."

Other changes that track the Action Plan's specific goals, include:

- The Iowa Watershed Task Force is completing its work developing a framework for watershed planning in Iowa; and
- Programs are going strong to assist landowners in implementing water quality-friendly projects — from Farm\*A\*Syst (a voluntary education program) to Trees Forever's Buffer Initiative to the soon-to-be-approved Conservation Reserve Enhancement Program (CREP).

These positive changes have happened, says Keeney, in part because a large and diverse group made it clear that clean water is important to them, and to the future of Iowa. (For a copy of the Action Plan, call IEC at 515/244-1194.)

in upland areas from heavy run-off that damaged roads and bridges. As flood damages were being assessed, it became apparent that some adjoining neighborhoods that had received nearly identical rainfall had very different amounts of damages to roads and bridges.

Observations suggested that upland watersheds where runoff-control measures were in place received significantly less damage than adjoining watersheds without those measures. Dunlap Mayor Martin Smith said a watershed project that included a dam upstream from his town prevented terrible flooding. An analysis of flood damage data and location information on completed flood prevention projects in 12 counties, using geographic information system (GIS) tools, corroborated the Crawford County observations.

“When we first heard comments about damage reductions in areas with completed watershed projects, it made us curious to see if those effects were apparent in other places,” says the NRCS’ Adkins. “Looking at damage information and watershed project boundaries spatially helped us understand the correlation between damage reduction and completed projects. It also told a powerful story when the information was displayed on a map.”

The GIS map shows a sample of the information from Crawford County. It compares the location of sites where assistance was requested under the Emergency Watershed Program (EWP) to locations where watershed protection projects had been completed. Damage frequency and severity inside the completed project areas were significantly less than in adjoining watersheds outside those project areas that had experienced similar rainfall events.

This kind of evidence supports the recommendations of a 1998 Federal Emergency Management Agency (FEMA) Hazard Mitigation Workshop. The workshop report concludes: watershed work in upland watersheds around the state should be accelerated as a way to mitigate against the effects of future heavy run-off and flood events.

## Needs

1. Encouragement for watershed programs at the state and local level to address ecological concerns, including wildlife habitat conservation and protection of threatened and endangered species.
2. Expanded outreach and technical assistance programs to landowners for voluntary protection of biodiversity.
3. Increased support for heritage programs that identify and seek to protect rare species and/or habitats that will either benefit or be harmed by projects.
4. Continued leadership and technical assistance to private individuals and firms to promote high quality mitigation for unavoidable ecological impacts, and to require monitoring to determine results.
5. Continued support for environmental education efforts such as citizen water monitoring and nature mapping that help youth and adults to become informed about the wide variety of resources in their watersheds.

## Outdoor Recreation, Aesthetics and Historical and Cultural Resource Issues

Tourists flock to areas that have interesting and aesthetically beautiful natural settings, such as the Black Hills, the Rocky Mountains, and the Atlantic and Pacific coasts. Closer, favored destinations are the forests and lakes of Minnesota and Wisconsin. Here in Iowa, many people visit the pleasing environments of the northeast and northwest corners of the state where there are woods and high quality lakes, wetlands and streams that inspire relaxation and recreation. Throughout the state, places of beauty and interest beckon, and with some respect and effort, more can be made of statewide natural attractions that occur in small and large mixed stretches of forest, prairie and savannah, streams and rolling hills. Hiking and bicycling are popular activities, and the trails that attract tourists bring opportunities for alternative economic enterprises as well as encouraging healthy activities for residents of all ages.

Water sport recreation, swimming, canoeing, boating and fishing all depend on clean, clear waters that are not degraded by sedimentation, nutrients or dangerous pathogens. Watershed management that addresses erosion and livestock wastes will greatly benefit the long-term health and well-being of the state’s residents, as well as its aquatic resources.

Many Native American communities were built along streams and lakes and thus are disturbed when these lands are developed. Consideration of cultural, historic and aesthetic resources needs to become a routine part of watershed planning, and newly available computerized information can assist. Watershed planning can account for these historical sensitivities, and in some cases, take advantage of the multi-cultural opportunities that Native American ties to an area can provide.



Source: State Historical Society of Iowa

*This archaeological site in Plymouth County, which holds a detailed record of past Woodland cultures, also documents a long history of erosion.*

### Needs

1. Encouragement for watershed planning efforts and grant programs to consider recreation, cultural and historic resources and aesthetics.
2. Adequate training opportunities for planners, agency staff and community leaders to learn more about requirements for preserving cultural and historical resources.

### Climate and Precipitation Change Issues

An overwhelming majority of atmospheric scientists believe that sufficient evidence exists to conclude that global climate change is taking place and will continue. Many scientists predict that this climate change will cause an increase in weather extremes. High temperatures will be higher, low temperatures lower, droughts drier and storms more intense.

Removing carbon from the atmosphere is one way to reduce the amount of climate change that the earth is expected to experience due to human-driven, dramatic increases in atmospheric greenhouse gases. A new source of positive change for Iowa's agriculture comes from international demand for removing carbon from the atmosphere as a way to offset carbon emitted from other sources such as power plants. Industries and governments are already beginning to pay Iowa farmers to implement "carbon sequestering" practices.

Watershed management needs to consider the potential for these changes, and how they may affect future conditions — a small investment in prevention may someday prevent great expenses for a cure. Watershed management can help mitigate some of the potential impacts of global warming by promoting sustainable development, and designing facilities and projects with the future in mind.

### Needs

1. Additional expertise on energy and air quality issues on watershed advisory groups.
2. Consideration of the likelihood of greater weather variability, which could include more extreme rainfall and flood events, in the design and location of new structures and facilities, especially those built in flood-prone areas.
3. Incentives to encourage carbon sequestration as a sustainable development opportunity that can encourage economic diversification in rural Iowa and benefit watershed health.

### Drainage Infrastructure Issues

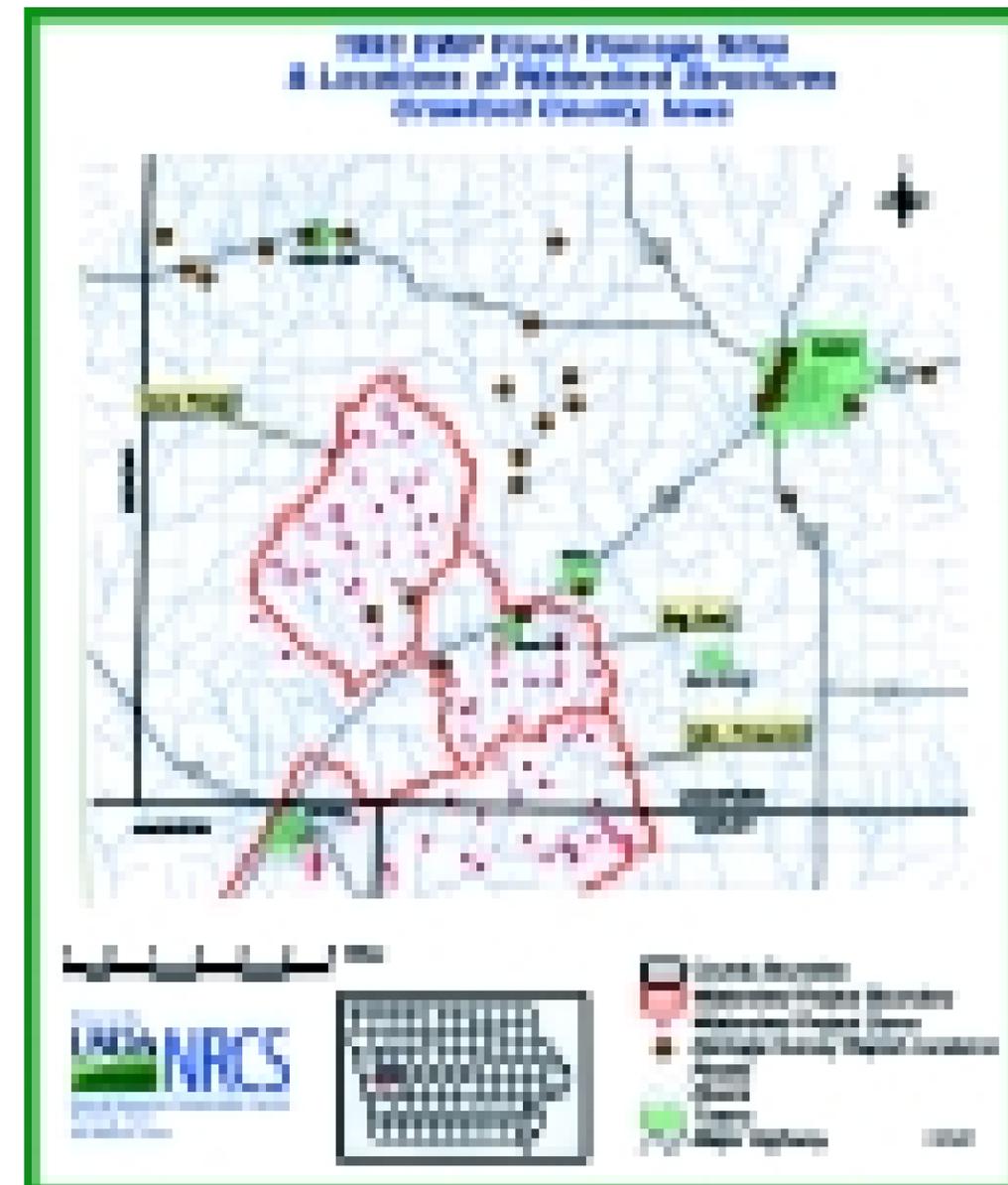
Many of Iowa's farm fields can be used for row crop production because the fields are drained with underground drainage tiles. This is particularly the case in the north-central portion of the state, in the geologic area known as the Des Moines Lobe. Drainage systems also are important in other areas of the state, including along the Mississippi River, where farmers depend on pumping stations to de-water fields that have become more vulnerable to flooding in recent times. Many of these agricultural drainage systems are installed and maintained by farmers working in conjunction with drainage districts, some of which have existed for almost a century. Drainage districts are legislatively authorized to assess costs (within the district) for activities that support agriculture and development, but have limited authority to address other watershed issues such as soil and water conservation.

Many drainage systems are old and districts want to renovate, update and expand their drainage and water control infrastructure. Districts need to coordinate with watershed programs to

## Crawford County Documents Flood Impact Reduction From Watershed Work

Iowa experienced its wettest summer in history during 1993. Flood damage was so widespread that all 99 counties were declared disaster areas by the federal government. The damages to public facilities alone were estimated at about \$30 million, according to the Iowa Association of Counties.

"Even so, it could have been worse," according to Marty Adkins, Assistant State Conservationist with the USDA Natural Resources Conservation Service (NRCS). Soil and water conservation practices that are part of watershed projects, including different types of sediment and water retention structures and terraces, and management practices like no-till farming, crop residue management, and contour stripcropping can significantly reduce erosion and runoff caused by high rainfall, explains Adkins.



Crawford County's experience during 1993 provided a good example. Here, as in the rest of the State, the storms and flood events resulted in widespread damages, much of which occurred

## Local Residents Band Together to Improve Briggs Woods Lake

Briggs Woods Lake is the centerpiece of the oldest county park in the state, established in 1919 in north-central Iowa. The 62-acre lake itself, built in 1968, drains more than 6,700 acres, almost entirely agricultural lands. Originally projected to have a 100-year life, the lake seems to be aging prematurely, leading local residents to complain about conditions there, especially excessive growth of algae and other vegetation.

In response, Hamilton County Conservation Board Director Brian Holt convened a public meeting focused on long-term management of Briggs Woods Lake. About 50 local residents attended. Their strong interest sparked a series of follow-up sessions, with a smaller group of stakeholders recruited to participate in a sequence of facilitated meetings. This group represented groups like the Farm Bureau and League of Women Voters, as well as fishermen, county government, local schools and youth and agribusiness.

David Young, chair of the Hamilton County Board of Supervisors, an area farmer and certified applicator of pesticides and manure, participated. Young says the meetings, which pulled in experts to present information about the lake and watershed, sometimes left him feeling defensive, but were a learning experience for everyone and allowed participants to share a lot of information that helped bring people together. Out of that learning, participants developed a draft mission statement, “To sustain the Briggs Woods Lake Watershed so that humans, agriculture and nature can peacefully and profitably coexist.”

To achieve this mission, the group drafted a set of recommendations, priorities and action steps. Those steps include forming a watershed council, whose early priorities are to initiate a monitoring effort to better assess the lake’s water quality and inputs, and to obtain funding to hire staff. Both action items are underway, and a small grant from the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship (DSC-IDALS) will make it possible to hire a part-time coordinator to help the group maintain focus and keep things moving.

Focus and funding are two critical elements emphasized by Holt and Young. Both credit professional facilitation with helping the group focus productively during the initial meetings. To sustain that focus, they say, a coordinator is needed to build on the positive beginning while boosting interest, involving more watershed landowners, and seeking resources to do the work. Both are concerned about the challenges of finding those resources.

“Everybody is busy,” says Holt, “and local government is trying to stretch thin resources. Even if the community perceives a need as vital, costs are going up for existing responsibilities for health care and education. Counties are strapped with the threat of property tax freezes — there is no room for growth. We see needs, but have limited abilities to take the kinds of actions we know are needed to educate citizens for both local and national interests. That’s why support from the state and private interests have to be part of the mix if we are going to move forward.”



Source: Kent Newman

*Members of the Briggs Woods Lake Watershed Committee visit the lake as part of a watershed tour, June 2000*

limit damaging impacts. In some cases, drainage districts are taking the lead in local efforts to protect and improve natural resource management through creative management of water quality and quantity. These type of innovative approaches are vital to address current challenges, including regulatory requirements and the farm economy.

Urban storm water management systems also provide drainage and modify watershed patterns, impacting water flows and quality. Increased urbanization brings new roads and streets, more houses and more highly compacted residential lawns. These changes mean reduced infiltration in the landscape, and more water pouring more quickly into streams and drainage ways.

### Needs

1. Review of state codes impacting drainage and levee districts, and updating, if necessary to include broader goals among their purposes and restructuring districts so that they include relevant urban stakeholders and/or conform to watershed boundaries.
2. Revised assessments/taxation so that all those who benefit from drainage help pay the costs (for example, when urban storm-water improvements increase damages or drainage costs for neighbors downstream or downslope, fees need to reflect these costs and provide appropriate remuneration).
3. Additional options for appeals or waivers for landowners who choose to maintain or establish wetland areas or implement habitat improvements that would be negatively affected by drainage projects.
4. Increased technical assistance to explore options beyond “improving” drainage infrastructure.
5. New linkages between urban and rural drainage projects, especially where improvements are likely to impact downstream neighbors.

## Friends of Backbone Organize to Combat Lake Deterioration



Source: Strawberry Point Economic Development

*Backbone Lake is a popular attraction in northeast Iowa, attracting as many as 900,000 visitors each year.*

The Maquoketa River sits in the Mississippi River watershed and flows into a reservoir at Backbone Lake State Park in Delaware County. The waters and their condition are of vital interest locally, where the park and reservoir bring tourists who contribute significantly to the economies of several area towns. In 1997, a group of concerned citizens organized to combat the dramatic deterioration of Backbone Lake and the Maquoketa River Headwaters due to erosion and high levels of nitrate and phosphorous.

Darla Kelchen, the Strawberry Point economic development officer and treasurer of Friends of Backbone Park, remembers the condition of Backbone Lake. “Before excavation, the lake was only ankle deep in many areas. It was so mucky and slimy that people wouldn’t swim or fish in it.” The impact of the erosion was felt on Main Street. The local communities were losing 20-25% of gross annual income because the lake and river was no longer attracting visitors.

In 1996, the DNR drained the reservoir in order to repair the dam. This gave the local residents an opportunity to come together and save the lake and river that had become such an integral part of the community and economy. Through private donations, Friends of Backbone Park were able to excavate the reservoir. Local businesses donated the equipment, trucks, and labor to remove the silt. For six weeks of the winter of 1997, excavation was done at night after the workers had spent all day at their regular jobs. Area residents opened their homes for the workers to warm up and get food through the long nights. When the work was completed, over 150,000 tons of silt had been removed from the lake.

The Friends of Backbone Park kept their momentum after the excavation project. In 1999 the group officially incorporated in order to maintain the work they have already done as well as start new projects in the watershed. Currently, the group is active in the Maquoketa River Headwater Project passing out water testing kits and encouraging local farmers to work towards reducing erosion in the area.

The collaboration of rural and urban citizens makes this a good example of the impact of watershed management on an entire community, and the success that can result from a community-based approach. Just ask the 900,000 visitors that enjoyed Backbone Park last year.

## Landowners Make a Difference for Creek and Community

Manley and Linda Bigalk have dedicated themselves to helping restore the creek in northeast Iowa that bears their family name. The center of the Bigalk land for over a hundred years, the creek has served for generations as an area for picnics, family gatherings and fishing.



Source: Iowa Farm Bureau Federation

*Manley and Linda Bigalk are making a difference.*

“One day I just noticed the creek was a mess,” says Manley. “We were always so close to it that we couldn’t see what was happening.” All the cropland in the fishable part of the stream’s watershed is prone to high erosion. This erosion was amplified by cattle grazing right into the creek, trampling down the streambank as well as intensive farming practices in the watershed. The creek had been stomped down to the point where portions of it were shallow, wide and unsuitable for trout.

The Bigalks were the first producers in Howard County to step forward on behalf of the troubled creek. In 1992, with assistance from the Iowa Department of Natural Resources (IDNR), the Natural Resources Conservation Service (NRCS), and the Division of Soil Conservation - Iowa Department of Agriculture and Land Stewardship (DSC-IDALS), the Bigalks fenced off their cattle herd from the stream and installed nose pumps to provide water to the livestock. Tree plantings, streambank stabilization, trout habitat structures and a cattle crossing were also added to their property along the creek.

“It’s interesting and satisfying to see the improvements we’ve made to water quality. There’s a lot less algae growth and just an overall naturalness to the stream now,” says Manley. Even more telling than the aesthetic benefits of the project is the improved trout habitat in the creek. A 1999 survey found a 600% increase from 1992 in the number of rainbow trout. In addition, the creek is now one of only three in the state that support natural reproduction of rainbow trout.

The work Manley and Linda did on their property became a catalyst for an overall watershed improvement project. “Now almost all of the landowners have gotten involved,” says Manley, “and the entire community has a sense of ownership.” The Bigalks give much of this credit to Frank Moore, their local project coordinator with DSC-IDALS, who was able to promote the project to the entire watershed and encourage broader changes in farming practices also aimed at protecting groundwater and increasing profits for producers. For example, the Bigalks have gone to no-till farming (maintaining a comparable yield for the area) and many local cattle producers have implemented innovative methods of handling livestock waste.

The Bigalk Creek Water Quality Project has surpassed many of its original goals by reducing sediment and livestock manure reaching the stream by 50 percent. This achievement gained national attention for the project as one of 30 success stories named under the federal Clean Water Action Plan in 2000. People who haven’t seen Bigalk Creek in the last 10 years might not believe their eyes. Bigalk Creek is now a beautiful setting and a topnotch trout stream.

## IV. ESSENTIAL TOOLS FOR WATERSHEDS

Watershed efforts, at the local, regional or state level, require support to succeed. That support may come in many forms. The Iowa Watershed Task Force was charged with studying the condition of watershed protection in Iowa, with the intent to identify a structure or framework that can enhance cooperation and coordination of watershed work. To build and maintain a structure, one needs tools. Out of the many useful tools that can contribute to successful watershed initiatives, several were identified by the Task Force representatives as particularly critical. These are discussed below, and include:

- **Monitoring and assessment** provides the information on which to base intelligent plans for effective actions.
- **Geographic information systems** gather available information and integrate it into a landscape context so that it can be easily accessed and visualized.
- **Community involvement and collaboration** connects people with planning and decision-making so that learning and networking can happen, and so that solutions can be developed which will receive broad support.
- **Financial and technical assistance** fuel implementation, giving people practical opportunities to turn ideas into action.

### Monitoring and Assessment of Iowa’s Water Quality Status

Water monitoring measures the impact of Iowa’s complex society on the aquatic environment. Monitoring provides information that can be used to assess water quality conditions, identify and interpret those conditions, and help determine effective solutions to problems. Water quality monitoring and assessment activities have been limited in Iowa, compared to many other states.

#### Goals for state water quality monitoring include:

1. Obtaining data on nutrients, synthetic organic compounds, sediment and aquatic organisms;
2. Measuring the variability of aquatic environments in the state to improve collection of new data and better use existing information;
3. Improving public information and the availability of data on Iowa’s water resources; and
4. Involving citizens in meaningful data collection and education activities, through IOWATER and other programs.

To achieve its goals for water quality monitoring, the IDNR is working with an advisory group of experts, both inside and outside of state agencies, including Iowa State University, the U.S. Geological Survey and the Environmental Protection Agency. Citizens are also being consulted, in response to heightened public concern over the health of Iowa’s waters and the lack of good monitoring information to gauge their condition.

Iowa recently summarized the water quality status of its major watersheds, as part of national Clean Water Action Plan activities. The resulting *Iowa Unified Watershed Assessment, Restoration Priorities, and Restoration Action Strategies* gives a snapshot of the major challenges facing Iowa watersheds and categorizes watersheds according to their needs for restoration. The result was to place all of Iowa’s HUC-8 watersheds into the highest needs category, based on the percentage of waters that failed to meet water quality goals and other pertinent factors, such as potential threats from row crop production and intensive livestock facilities. The *Unified Watershed Assessment* reiterates priorities established by the federal-

state Section 319 Nonpoint Pollution Control Program. Both give most attention to publicly owned resources and water bodies that have local, regional or state importance, as well as wellhead areas around public water supply wells and areas near the intakes of public water supplies that rely on surface water sources.

The process of listing the state's impaired waters, and the related Clean Water Act requirements to develop Total Maximum Daily Load (TMDL) estimates for them is another way that Iowa's polluted waters are being assessed, prioritized and addressed. A TMDL has been likened to a "pollution budget" for a lake or stream, an estimate of how much of a pollutant a waterbody can carry before it would be classified as impaired. Iowa's 1998 list of impaired waters included 157 waterbodies that do not meet water quality standards. Calculating accurate TMDLs and developing realistic plans to bring waters up to standards depends on good information from monitoring, requiring a detailed knowledge of a pollution source, how it gets into water and its "fate" once it is in the water.

Currently, the state is developing TMDLs for Corydon Reservoir in Wayne County, Rock Creek in Clinton County and Nine Eagles Lake in Decatur County. Waters scheduled for TMDLs in 2001 are Bob White Lake (Wayne), Arrowhead Lake (Pottawattamie), Yellow Smoke Lake (Crawford), Cedar Lake (Linn), Fairfield Reservoir #2 (Jefferson), Lake Miami (Monroe), Slip Bluff Lake (Decatur), Rock Creek State Park Lake (Jasper), Binder Lake (Adams), Orient Lake (Adair), Silver Lake (Delaware) and West Lake (Adams). Further assessments are planned for nine streams and two rivers.

**Geographic Information Technology**

For many years, program managers have struggled to obtain and comprehend information that is critical to project planning and implementation. Needed information includes land uses, soil types, topography, floodplains, water quality data, land values and location of infrastructure like roads, sewers and drinking water sources. Now, Geographic Information Systems (GIS) software has matured and relatively inexpensive computer hardware capable of handling GIS software is more available. It is currently possible to gather watershed data layers and integrate them in order to answer questions, help people visualize relationships and solve problems.

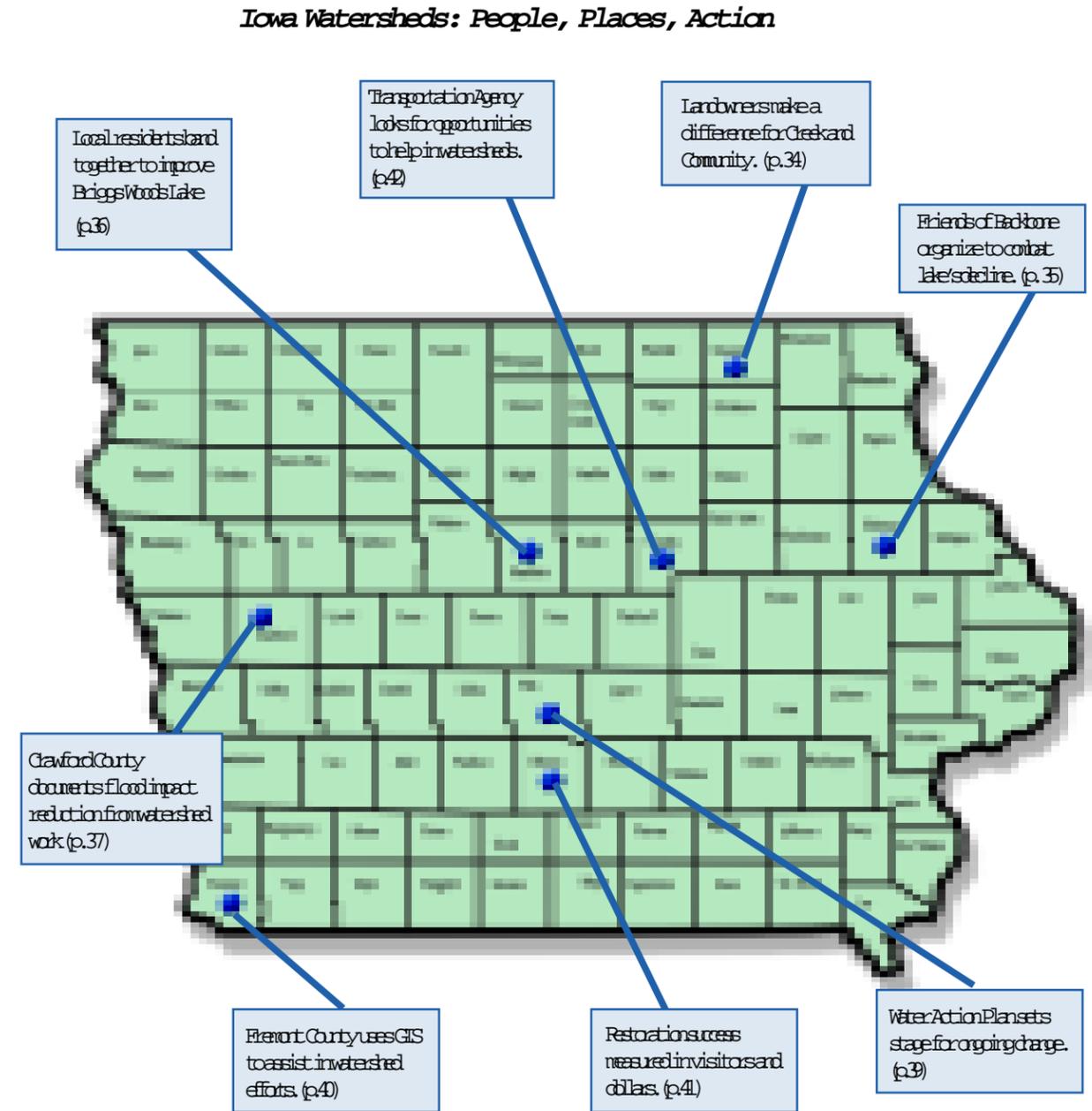
*One of the benefits of GIS technology is its value as a communication tool.*

GIS computer technology enables users to analyze multiple fields of information in spatial relationship to each other. For example, data organized in a GIS and displayed on a map might help a watershed project manager understand that the most erosive soils in the watershed are in a rural area of a county, near a stream that crosses three blacktop roads, where urban growth is planned. Such information is invaluable to help provide accurate and graphic assessment of watershed land use and pollution threats. It can help different groups develop a more objective framework from which to begin discussion and work towards consensus. It can also help the private sector avoid costly development mistakes.

One of the benefits of GIS technology is its value as a communication tool. For example, it is difficult to fully understand the often-complex circumstances of a specific watershed project or to explain the complexities of the project to local decision makers and interested citizens. Multi-objective projects can make these situations even more complicated. GIS is well suited to aid communication: if a picture is worth a thousand words, then an intelligent, dynamic map that can be easily modified through queries of the underlying data, can be worth a hundred pictures.

GIS can help people think in terms of watersheds and develop a better understanding of the nested nature of watersheds at different scales. Whether one is working at the 8's, 11's or 14-digit HUC level, a planner or a citizen has a common set of boundaries and the ability to fill

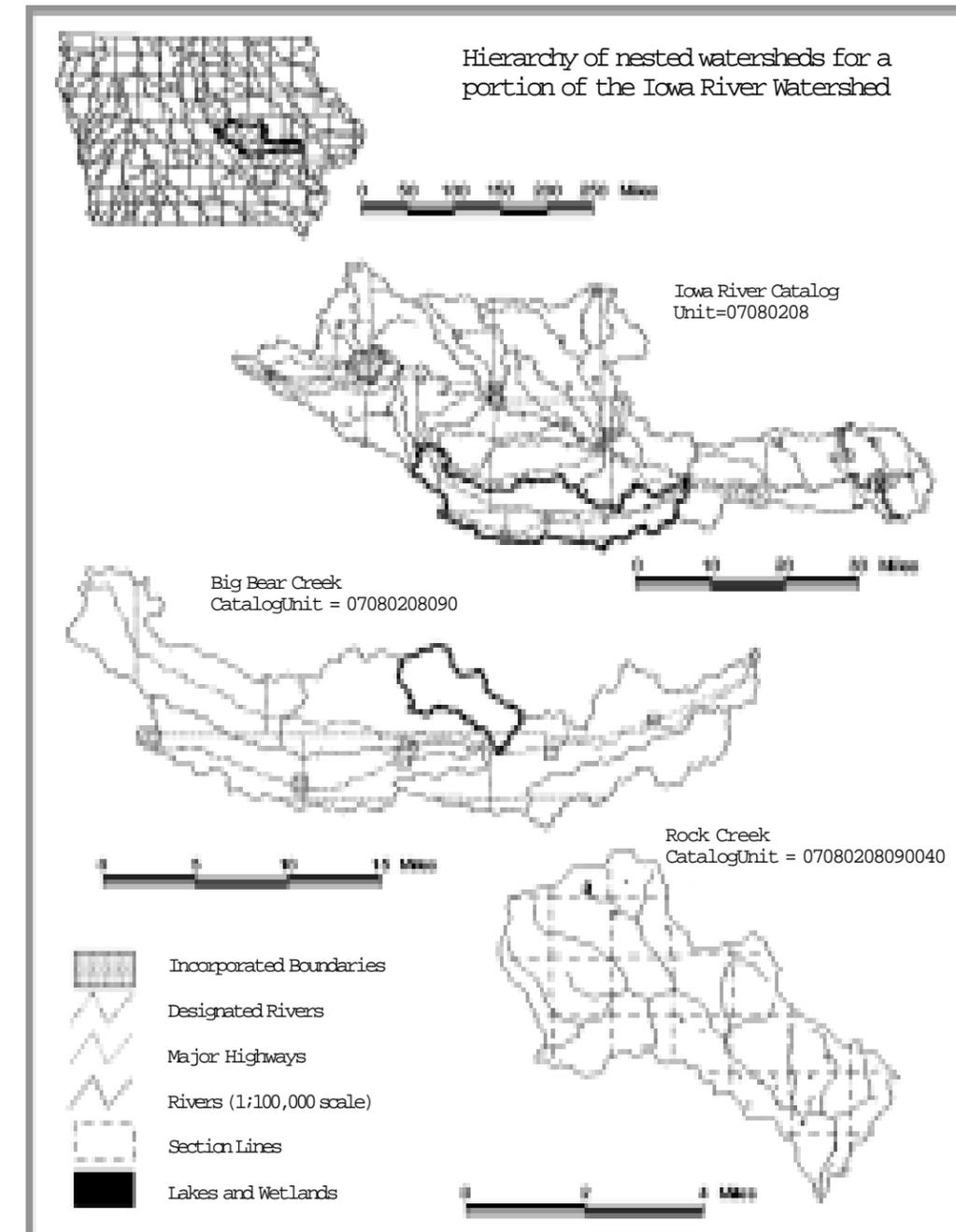
**V. IOWA WATERSHED SHORT STORIES**



*See individual Case Studies on following pages.*

in the watershed boundaries with existing land use, population, soils, topography and other spatial information. Availability of this information in GIS format allows questions that can lead to more effective protection strategies to be answered quickly. For example, within a watershed, what are the number and location of highly erodible acres or public wells? Or, based on miles bordered, would the quality of a stream be more likely impacted by urban lawn care practices or cropland management?

Figure IV-1.



Source: Iowa Department of Natural Resources

Iowa has a good deal of information available in the form of GIS data, however, there is a vast amount of information yet to be developed in this format. Available coverages include soils, levees, public wells, water treatment plants, sewage treatment plants, hospitals and schools. Digital data on historic wetland distribution and wetland restorations are partially available, particularly for the north-central portion of the state. Other examples of watershed-relevant landscape data that are now being developed and georeferenced include:

- fields enrolled in the Conservation Reserve Program (CRP);
- 100- and 500-year floodplain boundaries, which enable us to know how many acres and structures are in the floodplain;
- dams that are aging and will need replacement/maintenance;
- agricultural drainage wells;
- public water supply wells;
- large animal feeding operations;
- high quality habitats like prairies, savannas, sedge meadows, fens and algific slopes;
- information from archaeological and historical surveys; and
- drainage district boundaries.

GIS is only able to help decision makers if the data has been accurately gathered and georeferenced (located on the earth's surface based on assigning mapping coordinates). Iowa continues to face major challenges in this area. Certain important kinds of data simply have not been gathered and other data have not yet been converted into a computer usable format. Coordination is needed to bring different kinds of information together. Also, availability alone does not mean accessibility. GIS training is needed to help make this information usable for a wider group of professionals and volunteers.

Demands from those doing the work in watersheds will require better data delivery solutions in the near future. Funding for data development and maintenance, and coordination among government, the private sector and non-governmental organizations are important issues.

### Community Involvement and Collaboration



Source: Natural Resources Conservation Service

*Students collect and test water samples from a small stream as part of a corps of volunteer water quality monitors in the state of Iowa.*

Community involvement and collaboration are the not-so-secret ingredients that help assure the ongoing success of a watershed project. If it is lacking, even the best ideas will struggle and likely, fail. That is why the Nation's Clean Water Action Plan identifies community involvement as the "driving force" necessary to successfully improve watershed health.

There are a variety of blueprints to achieve collaborative partnerships that can build a strong watershed project or program. Elements include identification of the right stakeholders, outreach and communication, education and information, relationship-building, a respectful atmosphere, positive leaders willing to take responsibility, and feedback to support future involvement and action

(see Appendix 2's -Local Workgroup Material). Such elements are needed to build consensus around problems and solutions. However, watershed issues are often controversial and complete consensus is not always possible. Groups need to agree upon how they will approach such

situations. One alternative to consensus is the "informed consent" model, where a level of agreement is accepted that can allow participants to respect collective decisions based on an open process, best available information, sound discussion and good judgment.

Facilitation is a skill that can assist collaboration, and trained, neutral facilitators who are knowledgeable about watershed issues can help groups coalesce and find common ground. Facilitation can save time, reduce frustration and set the stage for more open and creative problem solving. The skills to bring people together and help them chart a course to action are not automatically available within a program or a local project. Process is important for many reasons, including its connections to issues of democracy, fairness and opportunity for input. Trained facilitators can help address these concerns, while keeping the group focused and action oriented. Such help may be available through private organizations, through extension-based community development specialists, or through governmental agencies. In many areas, however, affordable facilitation assistance is limited or nonexistent. In general, more state funding, training and technical assistance are needed to support local leadership and to leverage federal and private resources.

### Financial and Technical Assistance

Watershed-related needs for expanded financial and technical assistance are outlined in Section III Issues and Needs. While many programs and resources already exist to support watershed programs, additional resources are needed to serve identified needs, especially to link programs effectively with local communities. This problem is likely to continue as long as Iowa ranks at or near the bottom on the list of states in terms of per capita spending for natural resource protection.

*There are many models for partnership and success.*

There are many models for partnership and success. In Iowa, the Watershed Protection Program is one vehicle, specifically designed to address the multi-objective needs identified in this report. Created in 1999 and administered by IDALS-DSC, first-year funding was \$1.25 million with an increase to \$2.7 million in FY 2001. Most of this is distributed through soil and water conservation districts for Watershed Protection Fund (WSPF) grants. The new grant programs' purposes go beyond water quality, but the WSPF program is being closely coordinated with other water protection-related grant programs sponsored by IDALS and IDNR for nonpoint source water quality protection. They are also being dovetailed with programs administered by the USDA-NRCS. (See Appendix 3: Iowa Water Quality Project Directory for a map and information about these and other projects.)

The WSPF grants have two components: implementation grants and planning/development grants. The implementation grants have now supported two dozen local efforts aimed at reducing erosion, preventing flooding, enhancing habitat, increasing recreational opportunities and achieving other goals. These grants have ranged from \$9,600 to \$280,850. The development grants have been viewed as seed money for planning, assessment and partnership-building activities that will lead to more successful and sustainable long-term projects. During the first year, just over \$150,000 was distributed in small development grants for 18 planning efforts in 20 Iowa counties.