Ensuring Citizens Have A Voice

... a Guide to Watershed Management Planning





Mackinaw River Project

Ensuring Citizens Have a Voice

...a Guide to Watershed Management Planning

Based upon the experiences of the Mackinaw River Project

Writer - Diana L. Hall

Coordinator and Editor - Ruth Ballowe

Illustrator - Mary Buswell

Writer "Summary of Watershed Management Plan" - Rebecca Anderson

Project Staff

Project Director - James P. McMahon
Project Manager - Diane Rudin
Aquatic Ecologist - Dr. Michael Retzer
Land Steward - Vern LaGesse
Administrative Assistant - Karen Sheets
Director of Conservation Programs - Michael Reuter

Design - Doyle Lefebvre & Associates Printing - StarNet Digital Publishing



Acknowledgments

This handbook is dedicated to the people of the Mackinaw River Watershed.

Special thanks to:

The Mackinaw River Executive Committee

Planning Team Members

Action Team Members

Technical Advisory Committee Members

The Nature Conservancy of Illinois

Illinois Environmental Protection Agency

Photographs:

Mary Jo Adams — p. 35

Jane Ahrends — p. 58, p. 61, p. 80

Susan Anderson — p. 12

Harlan Dillon — p. 62

Steve Gough — cover aerial, p. 66

Michael Jeffords — cover photos, p. 43, p. 73, p. 76

Vern LaGesse — p. 81

For additional copies of this handbook and/or the accompanying video "Mackinaw River Project - Building Partnerships Over Land & Water" please contact:

Illinois Environmental Protection Agency

Bureau of Water, Planning Section

P.O. Box 19276

Springfield, Illinois 62794-9276

Phone: (217) 782-3362, Fax: (217) 785-1225

This publication was prepared using U.S. Environmental Protection Agency funding under Section 319 of the Clean Water Act distributed through the Illinois Environmental Protection Agency. The findings and recommendations contained herein are not necessarily those of the funding agencies.



Table of Contents

Introduction
Chapter 1 – Build A Watershed Protection Team
Identify and Engage People Who Have a Stake in the Watershed
Establish Your Organization
Write Your Strategic Plan
8
Chapter 2 - Learn About Your Watershed
Develop a Watershed Map
Gather Water Quality Data
Soils and Geology
Study Instream Habitat
Collect Hydrologic Data
Study Aquatic Populations
Study Land Use Along the Watershed
In Conclusion
Chapter 3 - Develop a Plan of Action
Recruit Action Team Leaders and Members
Train the Action Teams
Develop Action Plans
.
1) Analysis
2) Research
3) Action Identification
4) Presentation of Initial Plans to Planning Team
5) Writing
6) Cost Benefit Assessment
7) Presenting the Action Plans
Identify Gaps and Overlaps in Action Plans
Set Measurable Conservation Targets
Chapter 4 - Protect and Restore Your Water Resource
How Much and Where
Who Decides?
Protect Best Sites First
Prioritize Critical Uses
Table 4.1 – Create a prioritization grid listing the sites, the priority factors,
and the major stressors 45

Decide Where Work Can Best Alleviate Target Stressors	.44
Select Best Management Practices	
Consider Demonstration Projects	
Locate Funding Sources	
Prepare for Implementation	.49
Complete a Master Schedule	
Write Your Watershed Management Plan	
Build Public Support	
Chapter 5 – Evaluation and Follow Up	.55
Stay Organized	<i>5</i> 5
Develop an Evaluation Plan	
Focus on Measurable Objectives	.57
Determine Which Questions to Ask	.57
Collect Data	58
Adjust the Watershed Management Plan	59
Prologue to Chapter 6	.61
Chapter 6 - Mackinaw River Project as Case History	
Targeting a Priceless Prairie River	
Building the Watershed Planning Team	
Learning About the Mackinaw	
Action Teams	
Building Public Support	
Demonstration Projects	
Implementation – Where Do We Go from Here?	.80
Bibliography	.83
Glossary	8:
Appendix A: A Summary Mackinaw River Watershed Management Plan	

Introduction

"The relationship between the land and the river is symbiotic. These natural habitats serve as a filter for water and other elements entering the river. Eliminate the habitats for the sake of food production, and water volume increases. Increase the volume and you risk more habitat. There has to be a way to produce food and protect the land, and do it all at a reasonable cost to everyone. That's what this project is all about."

Terry Giannoni, farmer and Mackinaw River Project Executive Committee Member

WORDS TO KNOW

Watershed:

The surrounding area of land which drains into a water body by surface or subsurface flow.

Il of us live in a watershed – whether we farm along the banks of a river or live in a suburban neighborhood. Every time each one of us fertilizes our lawn, washes a load of laundry, or drinks a glass of water, we are having an impact on our watershed. And the waters that flow today from our septic systems, suburban lawns, or expansive farms do not magically leave the system – they will be the same waters our children use to bathe our grandchildren. The story of water is one of cycles – around and around it goes. We are all, every one of us, part of that story.

Developing a watershed management plan is your opportunity to play a positive and enduring role in your watershed's story. Completing this voluntary plan will involve attending many meetings, conducting inventories, struggling with difficult solutions, searching for funding, monitoring water quality, and tackling a myriad of other challenging tasks both mundane and exciting. But very large issues are at stake: you are taking care of the waters with which you have been blessed.

Throughout the handbook, we will provide stories of the people, who, like you, have taken responsibility for their water resources. Although these people had widely differing opinions, motivations, and personalities, they were able to come together and write a voluntary watershed management plan – a truly incredible achievement. Whatever your motivations for undertaking such an ambitious project, we hope you are inspired by their stories.

the ultimate goal ... to have a watershed

in which humans, agriculture,

WORDS TO KNOW

Stewardship Ethic:

Individuals who adopt an ethic of stewardship assume responsibility for helping to preserve and manage the long-term health and stability of an ecosystem, a species, etc. This attitude of respecting and valuing ecosystems, other species, and so on, is in marked contrast to the attitude that nature exists simply or primarily to be used for the benefit of human interests.

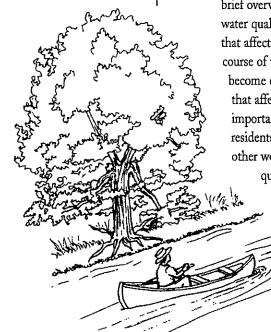
Our overall goal is to use our experience to help you - whether you are a rural land manager, agency representative, farmer, or a concerned watershed resident - develop your own local watershed management plan using landowner-based strategies. To ensure that the plan will be put into practice, we believe the plan must be written by those who live, work, and raise families in the watershed, rather than by outside organizations. Since watershed residents have a vested interest in the plan's success, they are more likely to make the necessary long-term commitment, and can adapt the plan as knowledge and circumstances change.

We have developed this handbook specifically for a rural watershed, where the challenges, strategies, and solutions can be radically different from watershed protection efforts in urban watersheds. It will include a brief overview of factors that influence water quality, and human activities that affect these conditions. In the course of this discussion, it will become clear that the same factors that affect water quality are important to the watershed residents' quality of life, as well. In other words, what's good for water quality is good for people, too.

Within any truly
representative
watershed
protection project,
participants'
motivations and objectives

may vary widely. For example, some landowners may be interested in water quality, while others may be more interested in flood control or property rights infringement. Some may be motivated by the belief that by participating in your project voluntarily, they can have a voice, and avoid further regulation. This is not an unreasonable concern, and they may be commended for taking control of their destiny. If you are lucky, many of the landowners will be motivated by stewardship ethics; these are people who take responsibility as stewards of the land, and are open to new ways to improve their land management. Many will be motivated because they value the water as a recreational resource. As the planning process advances, however, watershed residents will learn more about the water resource and its dynamics, and their motives and objectives will mature. By the time the plan is complete, they will look on the land and waters in a new light.

In addition to the need for local community involvement, local, state, and federal agencies' participation is vital to the management plan's long-term implementation and success, since you will eventually look to them for funding and assistance. Many of the agencies you work with will have their own vision for the project. Ideally, by working together, the community and agencies can use the project as a way to achieve their goals through cooperative voluntary actions, rather than through regulation.



cities, and nature can peacefully and profitably coexist

You cannot write your watershed management plan alone. By doing so you may address all the issues that are important to you. However, your plan will not address issues important to other stakeholders in the watershed, and it will be an uphill battle to get everyone else to buy into your plan if they have not been involved earlier in the process. Without their approval and personal commitment, the plan will never be implemented.

If you involve people with widely varying concerns, how will it be possible to come up with a watershed

management plan? It is a difficult challenge, but other teams have met with success. The process works because although primary concerns may vary, the watershed management solutions that can address these concerns are often the same. And in the end, the ultimate goal for all

of those involved in watershed management planning is the same: to enjoy clean and healthy water resources, and to sustain a watershed in which humans, agriculture, cities, and nature can peacefully and profitably coexist.

Every watershed planning group's circumstances are different, and you may choose a different timeline than the one presented here. For example, if you are fortunate enough to have access to funds and technical experts, much of the inventory and analysis of the watershed may take place before your public education efforts begin. However, if yours is like most watershed teams, you will need to recruit experts from communities and agencies to help you in your technical endeavors. In this case, inventorying and analyzing your watershed may take place simultaneously with efforts to build a solid organization and raise public awareness of your effort. Although the order of these steps may vary, we believe they are all necessary to create a successful, flexible, and feasible watershed management plan.

> We have organized the handbook into six chapters, which will address the following topics:

I. Build a Watershed Protection Team

All the best information on your watershed and noblest intentions will get you nowhere without the support of watershed "stakeholders" - do not try to do this alone! Since you can't meet with everyone, create teams that are representative of the stakeholders in your watershed. The team-building process includes identifying and engaging people who have a stake in the watershed, defining an organizational structure, establishing an organization, defining the purpose and strategy for your watershed

information ... get you nowhere without the support "stakeholders."

All the best

and noblest

intentions will

of watershed

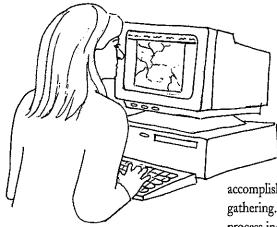
WORDS TO KNOW

Stakeholder:

Anyone with a stake in the watershed management plan. People who live, work, or recreate in the watershed. Local, state, and federal organizations and government can also be recognized as stakeholders.

Some of your goals will be accomplished within one year,

protection effort, facilitating the planning process, forming a technical advisory committee, inventorying existing efforts, coordinating with agencies and business and political contacts, and building public support.



II. Learn About Your Watershed

This chapter assumes that you have a minimum number of people and funds to

accomplish general information gathering. The steps included in this process include identifying watershed boundaries, developing a watershed map, and determining water quality within your watershed. In addition, we will describe how to gather information about instream habitat, soils and geology, stream flow (hydrologic) data, aquatic, plant, and animal populations, and historic and current land use. This is not meant to be an all-inclusive technical guide to studying and analyzing watersheds. Our goal is to give a basic introduction to the kind of information critical to developing a watershed management plan, and to suggest ways to get started in this process.

III. Develop a Plan of Action

Now that your team has gathered and reviewed the critical information about your watershed, it's time to focus on problems and solutions. You can accomplish this by forming action teams to address the different issues and stresses in your watershed. The action teams' duties include exploring and determining which strategies will most likely alleviate stresses on your watershed, identifying best management practices (BMPs), performing cost-benefit analyses, and identifying and researching potential funding sources. After the plans are complete, the planning team can approve and edit action plans, identify gaps, and set conservation targets.

IV. Protect and Restore Your Water Resource

At this stage, you are ready to take all of the information from Chapter Three and put it into your official watershed management plan. As you do this, you will need to decide where you should direct your limited resources, prioritize action plans, and develop a timeline. (Some of your goals will be accomplished within one year, while others may take 20 years to accomplish.) You will also identify areas where you need to add both technical and financial resources. Finally, you will be prepared to put your selected best management practices into action. We will also discuss public education efforts in this chapter.

WORDS TO KNOW

Instream Habitat:

Areas in a stream channel that provides aquatic organisms with adequate food and cover.

Best Management Practices (BMPs):

Methods that are used to prevent damage to natural resources; examples are filter strips, detention basins, woodland management, riparian corridor enhancement and terraces.

while others may take 20 years to accomplish.

V. Evaluation and Follow-up

As you implement the watershed management plan, you will need to evaluate the success of your efforts. Once the plan is developed, it is not finished - good plans need maintenance. The only way you will know your plan has been successful is if you measure some changes. Remaining flexible is critical; adaptations will probably need to be made to the plan. You will also need to decide on a long-term organizational structure for your planning team.

VI. Mackinaw River Project as Case History

In this chapter, we will give a general overview of the Mackinaw River Project. We hope this chapter, with its real life stories, will enable you to learn from our successes - and our mistakes.

Appendix

In Appendix A we will provide a summary of the watershed management plan completed by the Mackinaw River Project Team.

Appendix B includes a list of resources which may be useful to your team.



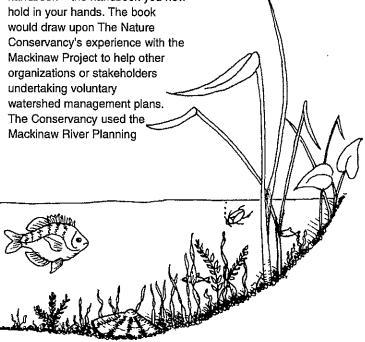
The Mackinaw River Project: A Study in Stakeholder Empowerment

In 1992, when The Nature Conservancy set out to protect one of Illinois' last remaining healthy prairie streams, it found a dedicated partner in the Illinois Environmental Protection Agency. Both organizations were intrigued by the Mackinaw River's remarkably high water quality, and both saw its protection as a priority. In addition, both groups were interested in protecting the river in an innovative way: by empowering local communities, landowners, and other stakeholders. After its completion, they hoped the Mackinaw Project would provide a model for other organizations and rural landowners working to protect and restore their own water resources.

To that end, the Illinois EPA provided funding to complete a watershed management planning handbook – the handbook you now hold in your hands. The book would draw upon The Nature Conservancy's experience with the Mackinaw Project to help other organizations or stakeholders undertaking voluntary watershed management plans. The Conservancy used the Mackinaw River Planning

project itself to "field test" the handbook.

With funding and partner support in place, in 1994 the Conservancy hired dedicated project staff for the Mackinaw River and accelerated its effort to demonstrate a community-based approach to the development and implementation of a watershed management plan. Both organizations envisioned the Mackinaw River project to be a model that could be replicated throughout Illinois. Three years later the plan was completed. Strictly a voluntary plan, it was developed and implemented by watershed residents themselves, who volunteered an extraordinary amount of time to complete the project. For more information on the Mackinaw Project, please see Chapter 6, "Mackinaw Project as Case Study."

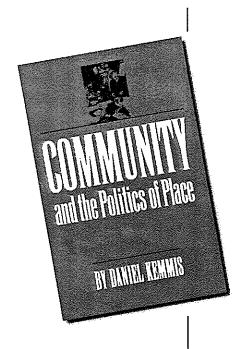


Chapter 1

Build a Watershed Protection Team

"This kind of mediated, participatory approach to problems is happening more and more frequently in an ever wider array of situations. Wherever it does happen, people find themselves being responsible for the ultimate decision, for each other, and even for their own ideologies in ways that they may never have experienced before ... It is, quite simply, the development of citizenship. As people learn to relate in this way to each other, they discover in their patterns of relationship a new competence, an unexpected capacity to get things done. It is not getting things done by using bureaucracies or other instrumentalities of "the government," but getting things done through the power of citizenship."

Daniel Kemmis, Community and the Politics of Place



n this chapter we will provide general ideas for how to build a watershed management planning team. Creating your team is not the same as forming an advocacy group, and it won't happen quickly; true community building takes patience, perseverance, and diplomacy. Often, just getting the diverse stakeholder interests from your watershed at the same table will be a victory. We have all been raised in what Daniel Kemmis, in his book Community and the Politics of Place, calls the "procedural republic." Our government is based on an adversarial system: traditionally, proposals are made in the public arena, and "public participation" consists of people coming to the meetings and advocating their position for or against a specific proposal. But in a truly participatory process, the public is responsible not just for advocating one position or another, but for making compromises – truly listening to diverse viewpoints, and developing solutions. And this is what must happen if you are to write a feasible voluntary watershed management plan.

To illustrate how this strategy differs from the way most of us are used to problem-solving, one complaint we hear from agency people is that landowners call for a voluntary process and are sensitive about their property rights, but when they have a problem with a neighbor, their first response is to ask the agency to deal with it. They are uncomfortable approaching their neighbor face to face, and want the impersonal, procedural regulation system to solve the problem instead. This is not a phenomenon limited to rural landowners, by any means. A suburban resident is more likely to call the police about a barking dog than approach the dog's owner in person. Similarly, when an environmental advocacy group

Learning a new way of solving problems – working them out together,

sees a problem with a water resource, it will be more likely to demand regulation than work cooperatively toward realistic solutions.

It is not easy to go against a lifetime of conditioning in our adversarial system, but it is possible. Learning a new way of solving problems – working them out together, instead of arguing over them at a public hearing – will take time and patience. Fortunately, many of us do have some experience with community work, including 4H clubs, softball leagues, etc. Most of us – particularly those of us who reside in rural communities – do also maintain a sense of "neighborliness" that will aid us in our efforts to work together.

Once people gather around a table and deal with each other face-to-face, they will begin to realize that they are

responsible for coming up with answers, rather than turning local problems over to a third party. Now that they are truly empowered and involved in a participatory process, anything is possible. Most of us are not accustomed to having our views listened to, and it's a new and invigorating feeling. This may be part of the reason that volunteer team members are willing to put in long, hard hours to make this process happen. It is citizen involvement at its best, and in a sense, writing a

voluntary watershed management plan is nothing short of revolutionary.

Identify and Engage People Who Have a Stake in the Watershed

By building a team that includes people who have a personal stake in conserving your water resource, you can help ensure that the watershed management plan your team develops will not gather dust on a shelf. It will be a living, feasible plan, which benefits from the support of the people most affected by its recommendations.

We refer to people who have a stake in the water resource quality as "stakeholders." Everyone living, playing, or working in the watershed, as well as those people who do not live there but depend on it for their drinking water, recreation, or value it as wildlife habitat, can be identified as a stakeholder. Make it your primary goal to engage a diverse team of stakeholders who are truly representative of your watershed. It is also important that if you are the person spearheading the effort, you live in the watershed itself; if you are an "outsider" it will considerably undermine your efforts to recruit a watershed team and complete a watershed management plan.

Along with landowners and residents in your area, one could also argue that some of the government agencies – especially the Illinois EPA – are



instead of arguing at a public hearing - will take time and patience.

stakeholders, because they have a public mandate to preserve water quality and ensure clean drinking water. Particularly in a rural community, building relationships between landowners and agency representatives may be one of the most challenging aspects of your job.

To identify landowners in a rural, agricultural watershed, the Farm Bureau, the U.S. Department of Agriculture's Natural Resources Conservation Service, and local Soil and Water District staff are all good sources. Along with the landowners, you should also familiarize yourself with communities, businesses, local VIPs, and other organizations active in your watershed. And since watersheds do not respect geographic boundaries, it is important to pay close attention to geographic diversity. The issues facing landowners upstream may be entirely different from issues that are important to downstream residents. Keep in mind that as well as increasing your chances for writing a feasible watershed management plan, a diverse and wellrepresented team will make it much easier to get assistance from within the watershed community and technical and financial assistance from agencies. It will also make your public information campaign more effective.

While getting to know the people in your watershed, you should familiarize yourself with your watershed's history. For example, have there been efforts in the past to clean up the water resource that failed? Were there easily



Sally Breese, Mackinaw Executive Committee Member

For seven generations Sally Breese's family has farmed the same 400 acres along the Mackinaw River, toiling on the land and living on the bounty of the river valley. The river played a vital role, she says, in her ancestors' lives:

they used the river as transportation, and had a grist mill on the river that would grind their grain. In the days before refrigeration they would cut ice from the river and store it on sawdust in icehouses, providing a source of ice that

lasted through the hot summer months. The good hunting, fishing, and ready supply of water were what drew her ancestors to the area, she believes. Sally is very proud of her family heritage, and perhaps more than most, is deeply aware that we are all temporary stewards of the land, keeping it in trust for future generations.

As one of the Mackinaw River Project Executive Committee's most dedicated volunteers, Sally has donated hundreds of hours to the Mackinaw River planning effort. By volunteering on the committee she helped ensure that farmers have a say in the river's future. "I wanted to be involved on the planning team because I wanted to have input into what was going on in the Mackinaw River," she says, "so that if any regulations or laws were to be enforced in the

watershed they would be something we could live with, and something that other farmers in the area could live with too." She is also deeply concerned that public use of the river could compromise the rights of landowners in the

watershed, and wanted to help prevent that from happening.

As a member of the agricultural action team, Sally used her farming expertise to focus on feasible strategies for local

farmers. "I think no-till farming can be very economical but it takes a few years to get started and to realize the economic value of it. I was really happy with the conservation credits for taxes for the farming practices, and I think that is a real important incentive that came out of the action team's recommendations. There's also the best management practices which could be coordinated with the credit conservation, and I think something like that is a real good idea."

Sally believes in conservation. But she also knows the hard realities of farming, and has worked tirelessly in the committee's efforts to come up with solutions that would sustain a way of life that has existed for generations.



You need to keep an open mind, and just as you hope others will listen to you,

discernible reasons - such as opposition from landowners, or lack of funding - why they failed? Have there been efforts to dam or channelize the river that were defeated? By whom? If you try to begin building your organization or persuading watershed residents before

> learning the local history of the river, you may unwittingly step into sensitive areas that may hinder your progress. You also do not want to duplicate efforts already

> > After you become familiar with primary stakeholders in your watershed and with its

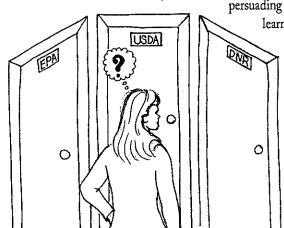
underway.

history you can begin the efforts to recruit stakeholders for your team. Many landowners may be initially suspicious of your motives. A crucial part of your early team-building efforts may involve convincing stakeholders, and landowners in particular, that you have no hidden agenda; your goal is to write a voluntary watershed management plan. Although it may be a long and even painful process at times, the energy you spend recruiting stakeholders will be well worth the effort.

Remember, a team made up solely of landowners does not represent the watershed stakeholders, and will fight an uphill battle all the way. As mentioned previously, there are other stakeholders whom you must bring

into the process as well. The inclusion of agencies at an early stage in the planning process is vital, because without agency assistance and cooperation, planning efforts will fail. Your team will eventually identify agencies as potential funding sources, and without agency input and expertise, the watershed management plan may not meet with their approval. The EPA, in particular, is ultimately responsible for water quality, and its input and support is essential to the eventual approval of the plan. No single group - whether it is composed solely of landowners, agencies, or private nonprofit groups can write a feasible voluntary management plan alone. They need each other to succeed, and it will be your job to bring them together.

As you build your team, you should resist the temptation to concentrate only on people whom you think will agree with you. Although this may be the easiest route in the beginning, you will not get widespread cooperation unless you are truly inclusive. While it will certainly help the process to include people who are friendly to your opinions, you also want to work hard to engage people who may initially see themselves as your adversaries. Without a truly representative watershed team, others in your watershed may ignore the plan that you worked so hard to develop. You need to keep an open mind, and just as you hope that others will listen to you, you need to be willing to listen to different opinions. Participants who initially attend meetings out of fear or



you need to be willing to listen to different opinions.

It is harder to point

fingers and avoid

sharing the blame

when you're sitting

across from

your neighbors.

hostility, eventually may become engaged in the process and become some of your most dedicated volunteers and best allies. As they become truly engaged members of the planning team, they will educate others outside the process who may be as skeptical as they were. Some of their friends and peers in the community will listen to them in a way that they may not listen to an agency representative or "environmentalist."

Although you will want people with

diverse opinions, you also want to ensure that they are not destructive to the process, and are respectful of others with dissenting views. Having a dissenting viewpoint is one thing; being an obstructionist or making the argument personal is

another. This is a tricky line to walk, but critical to the success of your effort. This group dynamic is the key to your team's success.

While they may want to be good land stewards, rural stakeholders are likely to be suspicious of any effort that may impinge on their property rights. Many of them distrust people they view as "environmentalists" and government agencies, and initially may be hostile to your efforts to engage them on a watershed protection planning team. Your initial job is to convince them that you are not there to make more regulations or point fingers. On the contrary, you are

there to facilitate a process that will help avoid more regulation. Often, winning them over is a matter of treating them with the respect that they deserve, and convincing them that you want their help in writing a voluntary watershed management plan.

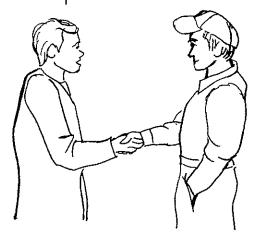
To accomplish this, after you have identified stakeholders and advisors, you can sponsor information-gathering meetings and explain your effort. We recommend holding small meetings of 10-15 people, so that real

discussion is possible.

Do not expect to be welcomed with open arms. In addition to convincing residents of your true motives, you will also likely expend a lot of energy building bridges between local agency representatives

and stakeholders. These initial meetings should be designed to bring stakeholders together, educate them about the watershed if appropriate, seek out expertise, and solicit their input. Participants may include representatives from key agencies interested in the watershed, such as the Illinois Environmental Protection Agency (IEPA) and Illinois Department of Natural Resources (IDNR), landowners, and other stakeholders.

As mentioned earlier, though, just getting these groups around a table will be a major victory. It is much harder for people to rail against the



Once you have identified and engaged stakeholders in your community,



Mary Jo Adams, Mackinaw Executive Committee Member

Mary Jo Adams, a landowner who resides along the Mackinaw River, was already a member of The Nature Conservancy before she joined the Mackinaw River Planning Team. As a self-described environmentalist, she entered the

process with a
different
perspective than
many of the farmers
along the river.
However, since
landowners on the
team shared
concerns about
water quality,
property rights, and
flooding, Mary Jo

was able to find a lot of common ground with her neighbors.

"I think those of us on the planning team have really put a lot of volunteer hours into this process and I think that's what made it work," says Mary Jo. "We have all gotten along together very well and we all really care about the project."

Asked why she and her fellow team members have been willing to volunteer so many hours, Mary Jo explains: "I think it's important for landowners to get involved because we are the stewards of the land. I believe we don't really own the land - we pay taxes on it but we're just stewards of it while we are here. It is a wonderful gift and we need to take care of it. Most of us want to pass on to future generation things better than what they were for us ... I think that's why most landowners should get involved - so they can find out how they can do their little bit to

make things better for the next generation."

Mary Jo believes that learning about the watershed in which they reside has been one of the most exciting aspects of volunteering for

the project. "It's natural human behavior to look at just your stretch of property and not really focus on what impact you have on others or that other people have on you," she says, "but to understand the whole picture is like

putting together a puzzle - if you have just a small piece of the puzzle you're not really going to understand the whole thing. So the process which I think has been really exciting, is that we've all gotten together, combined our own little pieces, so to speak, of the puzzle, and now we're really beginning to understand how the watershed works. A lot of people feel that their actions are so minimal it doesn't make a difference so the problem is going to be convincing a lot of these people that every little bit can make a difference."

The bottom line for Mary Jo, and for many of her team members, is their shared love of the land. "We ride our horses, hike, cross-country ski, and canoe and kayak the river. It's quiet and peaceful, and the sounds of nature are just wonderful. I wouldn't want to live anywhere else in Illinois."

"government" when the government becomes personalized, and they are sitting across from an agency representative. It is also much harder to point fingers and avoid sharing the blame when you're sitting across from your neighbors. Once you have these diverse interests willing to talk to each other, you're ready for the next step.

Establish Your Organization

Once you have identified and engaged stakeholders in your community, it is time to build an organization. The model we suggest for a communitybased, voluntary watershed project team consists of an executive committee, a planning team, a technical advisory committee, and action teams. Once again, every watershed is different (in other groups, for example, the technical advisory committee has functioned as an action team) and you should consider what kind of organizational structure will work best in your watershed. This organizational structure worked very well for us, and we believe it would prove useful for other watersheds. Depending on your circumstances, this organizational decision may be made by an agency staff person spearheading the effort, or it could be made by a core group of stakeholders.

The first step in creating an organizational structure is forming an executive committee. After your initial work researching your resources

it is time to build an organization.

...once you have a

core group in the

community, they will

be your best

recruiters.

and building relationships within your watershed, you may already be able to clearly identify a small, representative group of stakeholders who have been especially interested in your project, are willing to volunteer, and can serve as the executive committee. The committee's responsibilities include serving as a nominating committee for

the planning team, reviewing promotional materials, choosing and advising a project director, representing the project to the community, and appointing action teams.

(Although some groups may choose not to have a project director, we strongly encourage it.) Your executive committee should be a relatively small group (15 members or fewer), made up of people who represent primary interests in the watershed and provide geographic diversity.

Once the executive committee is in place, you can begin reviewing nominations for the planning team. (Executive committee members will automatically serve on the planning team.) The role of the planning team, which should consist of between 25 and 30 members, is to develop and approve a watershed management plan based on recommendations from subgroups called "action teams." (We will discuss action teams later in this chapter.) We cannot provide a precise formula for the make-up of your planning team, since every watershed is different. We can say, however, that in general, a rural watershed planning team should include representation from the following groups: landowners, local business people, town representatives, local organizations, recreational groups, the Farm Bureau and other agricultural service organizations, and people who may not reside in the watershed, but rely on the resource for drinking

water.

Key participants from your pre-planning process may help recruit volunteers for the executive committee and planning committee

planning committee.

Ideally, this is the way it should
happen; once you have a core group in
the community, they will be your best
recruiters. To ensure as much diversity
as possible, you should send
nomination forms to various groups in
the watershed, such as the Farm
Bureau, county boards, Soil
and Water Conservation
Districts, and municipalities
within the watershed. You can

Contact you.

Along with your

planning team,

you should also

also place ads in community

newspapers and post notices

asking interested citizens to

form a technical advisory committee.

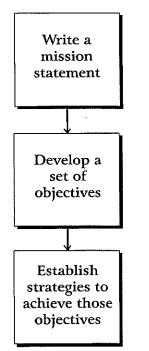
Action

Team

These are the experts in various fields related to watershed protection, and their assistance will be vital to your team's success. The advisory team should include agency representatives, experts from nonprofit organizations,

Having the mission statement and objectives clearly stated in black and white will

First Steps in Strategic Planning



WORDS TO KNOW

Facilitator:

Person or organization that guides a planning process.

and if available, academic experts from local colleges or universities. Your technical team will provide you with guidance throughout the process, and will help answer questions your executive and planning team members will have. You need help from the experts, and should not be afraid to ask for it.

Once you have your planning team in place, you need to bring the members together to define the purpose and strategy for your watershed management planning effort.

Write Your Strategic Plan

A strategic plan concisely states the group's vision of what the project will accomplish. To say the least, writing a strategic plan - even a short, basic one - can be a difficult, timeconsuming process, and you and the other volunteers need to set aside time to complete it. However, clarifying your mission and objectives is critical to your team's success, and will help keep you efficient. Once you've completed this document, your team can measure all future actions and recommendations against it. Having the mission statement and objectives clearly stated in black and white will provide focus, prevent misunderstandings, and help your volunteers avoid wasting energy on tangential meetings and activities.

The document should include your team's mission statement, a summary of objectives, and a summary of the strategies you will use to achieve those objectives. (If you have not already done so, at this point you will want to make sure you have a basic understanding of your water resource and the problems it faces; see Chapter 2 for information on researching your watershed.)

We strongly recommend bringing in an outside facilitator to manage the strategic planning process. A facilitator is a person who has been trained in the art of managing group meetings. Due to funding limitations, many teams will not be able to afford a professional facilitator. However, if at all possible, you should find an objective, experienced person to manage the process and facilitate your pre-planning and strategic planning meeting. This person should not be a member of the planning team itself objectivity is essential, since debates over the mission statement, goals, and objectives could be lively and passionate.

Community service agencies, such as local hospitals and universities, sometimes employ facilitators.

Conflict resolution has recently become a popular subject in colleges, churches, and even public schools.

Ask around – local news agencies may be able to point you in the right direction. Churches often train people to lead committees by facilitation, and you may be able to find some volunteers there. Another potential resource might be the League of Women Voters, which in some areas has members who have experience

provide focus and prevent misunderstandings and wasted energy

working with disparate parties. The local Soil and Water Conservation District may also have suggestions.

The term "strategic plan" does not necessarily refer to a lengthy, corporate-type document. In this case, simplicity is highly desirable. Ideally, your plan should be concise and simple enough to reprint as a small, three-panel brochure that you can distribute as part of your public education effort. Your goal is to provide focus for your group and reach consensus on some very basic issues - you don't want to get caught up in writing an overly-detailed strategic plan that will alienate volunteers, waste their time, and ultimately be ignored because of its complexity.

The first strategic planning task is to write a mission statement. Your mission statement should define the overall purpose of your organization. The mission statement, for example, might be as simple as "we intend to protect the natural resources of the watershed" or "we will improve water quality in the watershed." This may seem obvious at first glance, but when you are working toward true consensus, defining your purpose can be much more difficult than it seems - some of the participants may want to focus solely on the river or lake, while others may want to focus on lands within the watershed.



Larry Huggins, Facilitator, Mackinaw River Project

Facilitator Larry Huggins played a vital role in helping Mackinaw River Watershed Team members articulate their vision and make it a reality. The action team process outlined in this chapter is based on the process he helped develop.

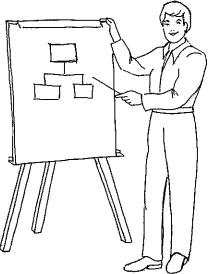
Larry believes the Mackinaw River Project was successful in part because of the members' practical approach. "A lot of planning efforts develop vague recommendations and very elaborate

and awesome visions of what the future could be without the means to attain that future," he explains, "and this group I think is remaining pretty down-to-earth and concrete. They're also being very specific about what would have the most impact on this particular watershed. These are people who live and work on the land, and they're not tolerant of abstract ideas."

"I've been really impressed with the 30 people [on the planning team] who are donating all this time free," says Larry, "and the 50 or 60 people who are involved on action teams are giving of this time purely to give something to this

community... this is a lot of hard work and that's just the plan. The contribution the people are making to this community is really inspiring to me. I could say that this is a wonderful example of

Jeffersonian republican democracy at work... that small town hall meeting decision-making based upon a community establishing a common vision of what they want their community to be, and then making the plans and developing the actions to make it so."



... there are no quick fixes

in watershed management;

WORDS TO KNOW

Conservation Tillage:

The management of farm activities and structures to eliminate or reduce adverse environmental effects of pollutants and conserve soil, water, plant, and animal resources.

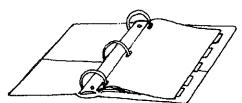
Retention Basins:

These serve as temporary "holding tanks" for large volumes of water that collect rather quickly, such as stormwater after a heavy rain. The water is then slowly released into the ground or through a pipe to a stream or riverbed.

Once the team has agreed upon a mission statement, the next step is to develop a set of objectives, which will define the specific goals you hope to achieve. Objectives might include creating a watershed management plan, reducing pollution in the river, improving biological diversity, reducing the velocity and frequency of extreme flood events, and addressing some specific issues in your watershed, such as urban growth. (You will need to call upon members of your technical advisory team to help you determine appropriate objectives.)

After the team has developed a set of objectives, you can establish the strategies you will use to achieve those objectives. Strategies might include the following: promoting conservation tillage; stabilizing streambanks; installing retention basins in towns; educating rural and urban landowners, civic, business leaders, and children about the project; improving municipalities' sewage treatment practices; improving the diversity of natural plant, aquatic, and animal communities within the watershed; and coordinating with agencies. Your strategies will necessarily be very general; it will be your action teams' job to identify specific stressors and solutions. As they discuss strategies, your team members need to understand there are no quick fixes in watershed management; these are long term goals and objectives.

Once you have completed the strategic plan and have identified general issues to address for conserving your watershed, you can decide what kinds of action teams you will need to help develop your plan. Action teams should have 10-15 people, and should be formed to address each individual issue. Action team members should include both experts and stakeholders. Their responsibility will be to study specific issues in the watershed, ascertain the magnitude of problems, identify solutions, look at cost/benefit ratios, and investigate funding sources and processes. They will then report their findings to the planning team. (We will discuss this process more at length in the next in Chapter 3, "Develop Action Plans.")



After forming your watershed planning team, you should put together informational notebooks for each team member to provide them with a basic understanding of the watershed. The notebook should include information such as a definition of watershed plans, a primer on water quality and water resources (river, lake, or stream), a description of your watershed and its major characteristics, maps, an outline of problems and stresses in the system

these are long term goals and objectives.

you have identified to date, an organizational chart, a project timeline, and a list of team members and resources. You should add more information as it becomes available. It is through the strategic planning process that your team will receive its first big test. Instead of relying on the procedural, adversarial methods of problem-solving, they will be sitting down at a table together, confronting difficult issues, and attempting to reach consensus. No one group or interest will get everything it wants; a strategic plan written solely by farmers would be very different from a plan written solely by municipal residents. But your team members should understand that regardless of their differences, they all inhabit the same watershed, and they must be willing to compromise if they are to achieve their goals. In a sense, building a watershed planning team involves old-fashioned neighborly values; watershed residents are neighbors with a common interest. Not only do they need to be willing to understand the impact their actions have on their neighbors, but they need to be willing to listen to their neighbors' point of view, and be willing to compromise.



Saving the Family Farm – A Lesson in Consensus-Building

Many of the farmers who comprised the Mackinaw River Project team worked land that had been in their family for generations. For these people, "saving the family farm" is much more than a romantic slogan; it is an issue they struggle with every day of their lives. As the team began developing the strategic plan, several members wanted to include the promotion of the

family farm as one of the Mackinaw River Project's objectives.

It was a highlyemotional issue, and the objective initially enjoyed popular support among the team members. However, there were questions. Through the process of consensus-building, participants were allowed to voice their concerns despite the majority opinion. Questions raised included: was this an appropriate objective for a watershed planning project? How many farmers in the Mackinaw River Valley were actually working family farms? How many of the farmers even owned the land they worked? Are families

the issue, or are agricultural practices the issue? Was this an achievable, measurable objective? Facilitator Larry Huggins played a critical role in helping guide the discussion in a constructive manner. As with other emotional discussions, he remained positive, and most importantly, neutral. When the discussion threatened to veer off into emotional,

tangential issues, Larry was able to bring it back to the topic at hand in a positive way.

In the end, the team decided that while it was an important value they wanted to promote in other

ways, saving the family farm was not an appropriate objective for the Mackinaw River Project's strategic plan. The objectives and strategies that the team ultimately decided to include in the plan were concrete, measurable objectives; an achievement that was critical to the team's eventual success.

	*
	(
	(
	(
	(
	(
	(
	(
	(
	(
	(
	Ċ
	Ì
	Ì
	Ĉ
	Č
	C
	C
	(
	Č
	6
	(
	6
	6
	(
	(
	6
	6

Chapter 2 Learn About Your Watershed

"As a storyteller, I have conditioned myself to listen. I have passed long hours squatting on a stone in the middle of Rock Creek allowing the music of the dancing water to filter into my thoughts, drinking the water and allowing it to flow into my veins. When the creek and I were held captive in the same riffle of water, I began to learn the songs of water."

Brian "Fox" Ellis

WORDS TO KNOW

Ecosystem:

A "community" of animals, plants, and/or other natural objects and the environment within which they live or function and interact.

rian "Fox" Ellis, an internationally known storyteller from central Illinois, writes in his book Stories from the Earth and Sky about listening to the story of the land. "You might want to imagine yourself a water molecule and flow from the clouds through the ecosystem to your faucet and back to the clouds," he suggests. As you tackle the job ahead and learn about the hydrologic cycle of your watershed, think of that water molecule, because its story is intricately linked with your own. You will find throughout the watershed planning process that your water resource and the plants and animals that live within it are related to you in ways you may not have realized. A mussel, for example, may be disappearing from the lake or river because of declining water quality — an important concern for anyone who depends on it for drinking water or recreation.

Before your team tackles issues such as improving water quality, it is vital that you gather some basic information. In the previous chapter, we outlined how to get together a watershed management team. At some point in that process – most likely when you have a small group of core volunteers together – you will begin researching your watershed. Only you can judge the best time to accomplish these steps, but there is one important principle to keep in mind: don't get your feet wet until you know what the problem is. Jumping in prematurely can drown your project. You may find that what seemed like a good conservation strategy at first glance may end up being a waste of money and time, or even worse. For example, you may decide to plant trees to stabilize a streambank, only to have your trees carried away by high waters because you have not addressed the problem of increased stream volume and velocity. You have then wasted money and time on tree

If you are careful to include qualified experts on your watershed protection team, you will be able to

WORDS TO KNOW

Stressors:

Factors which threaten the wellbeing or health and long-term viability of an ecosystem, a species, or a population. planting, and your team will be demoralized.

Assume nothing at the beginning: set out to develop a very basic knowledge about your water body. Make good use of agency contacts who can provide information that will enable you to make some necessary early decisions. Remember - don't reinvent the wheel as you begin your plan. Federal, state, or local public and private agencies may have already done much of the work. Often it is simply a matter of knowing whom to call, and this is the task with which we hope to help you. Many of the agency employees you contact at this stage are also potential recruits for your technical advisory committee and action teams (see previous chapter). As you begin developing your water resource protection plan, you will need help from the experts in understanding and analyzing the data.

In this chapter we will describe in very basic terms the types of information you can look for, and present ideas for where to find that information. Since we hope that this handbook will be used not only by experienced land managers, but by landowners as well, we are attempting to present the information in terms understandable to those new to watershed protection. We will not attempt to describe in overly technical terms how to gather this data; your time may be better spent recruiting those who are already experts rather than attempting to become an expert yourself.

If you are like many groups and have very limited funding – or even none at all – you will need to gather several core volunteers together and consider finding an agency or private nonprofit group to work as your close partner as you begin intensive watershed research. As well as providing information sources, the following section will give you some idea as to where to look for agency partners. (A good place to start is with your local Soil and Water Conservation District office.)

There are two important factors to keep in mind while you gather information. First, all of the information and data are interrelated: stream flow is closely related to instream habitat, which is closely related to water quality, which is closely related to aquatic species, etc. Any approach to conserving a watershed should be based on a holistic approach to data analysis, identification of stressors on the system, and potential solutions.

Second, a watershed system knows no political or cultural boundaries, and an action in one part of the watershed may have far-reaching repercussions. While many people realize, for example, that what watershed residents do upstream may affect their downstream neighbors, many people do not realize that because of river dynamics, the converse is also true: what residents do downstream may affect their upstream neighbors. As you gather your data and think about possible causes of problems in the

create a well thought out, technically sound, and feasible ... plan.

system, it is important to keep this in mind. Your project will not succeed without a holistic approach.

Once again, if you have little or no experience with understanding this type of information, do not let that deter you. Although agencies are often associated with regulation and enforcement, there are a lot of agency staff whose job it is to help you. In addition, if you are fortunate enough to have a university or college nearby, they are likely to have experts willing to pitch in. If you are careful to include qualified experts on your

watershed protection team, you will be able to create a well thought out, technically sound, and feasible watershed management plan.

agencies (see following sections). The State Water Survey map will not include this information, but the Survey staff can get these site locations for you.

Depending on the size of your watershed, the water quality will likely vary throughout, with some tributaries ranking higher than others. By comparing water quality in different areas throughout your watershed, you will get an idea of where to find the major problems within your system. In addition, if you have some tributaries with particularly high water quality,

biodiversity, and general lack of degradation, you may be able to use these tributaries as models as you tackle problems elsewhere in the watershed.

Assume nothing at the beginning: set out to develop knowledge about your water body.

WORDS TO KNOW

Assessment Stations:

Locations along a river or tributary where water quality is sampled for biological, chemical, and habitat data as well as stream flow.

Gage Sites:

A selected cross-section of a stream channel where one or more variables are measured continuously or periodically to index discharge, stage, sediment concentration and vield and/or other parameters.

Biodiversity:

A variety of natural plant, aquatic, and animal communities within the watershed.

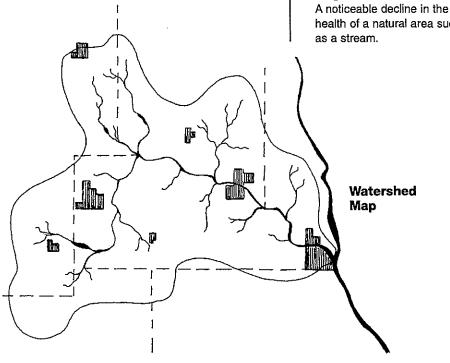
Degradation:

health of a natural area such

Develop a Watershed Map

Developing a map of your watershed is a good first step. At a minimum, your map should include the following information: the watershed boundaries, the counties within it, all river tributaries, roads, towns, existing water quality monitoring or assessment stations, U.S. Geological Service (USGS) gage sites, land use information, and state natural areas.

The best sources for your initial map are the Illinois State Water Survey (ISWS), NRCS, and the Illinois EPA. You should include USGS and Illinois EPA assessment sites on your map to enable you to analyze data from those



The first step in researching

water quality in your watershed is to



Malcolm Winkler, Mackinaw Executive Committee Member

Malcolm Winkler has grown corn, soybeans, and alfalfa in the Mackinaw River Watershed for over five decades, and says he likes the independent lifestyle that comes with farming. On the farm, he explains, "things need to be done,

and you see them and you do them."
He applies this same no-nonsense, practical approach to his work as a volunteer on the Mackinaw River Project Executive Committee. Since the Mackinaw River Watershed not only provides his way of life, but his

source of income as well, he had a vested interest in helping direct its future.

Malcolm brought a historical perspective to the team that proved

Malcolm brought a historical perspective to the team that proved useful as it studied changes in the river over the years. "In 1942 when we came here there were no dikes in existence... today the dikes are large enough that you can drive a tractor down the top," he says. "The volume of water has increased with that and that has been a lot of our problem... that's why I'm invested in this project. I know we're never going to stop flooding but we're interested to see if something can be done to alleviate a bit of our problem."

Malcolm hoped that by volunteering on the team and promoting voluntary measures, he could help avoid regulation and bureaucratic red tape in the future. "As a farmer, yes, I have a lot of concerns about... control of the farm by other

agencies," he says.
"You have to
remember that
almost every farmer
is an independent
business man, and
as such he conducts
his business in that
way... a lot of these
agencies that want to
help sometimes end
up controlling, and

this is what the farmer objects to."

Since he first volunteered for the project, he says he has learned not only a great deal about the watershed, but about his neighbors up and down the river as well. The diversity of viewpoints, he believes, helped the process. "I can see the difference in opinions (on the committee], which is good," he says. As a member of the Municipal Issues Action Team, he also learned a lot about the towns along the river and the water quality issues associated with them. Many of his opinions have changed, he says, as he has become educated about the watershed. "We're learning something every day in the Mackinaw," says Malcolm.

Gather Water Quality Data

Before you can improve water quality, you must know the causes of any current problems. When most people think of water quality issues, they think of chemical pollutants. While chemical pollutants are certainly a major concern, they are only part of the water quality assessment. In fact, in the Midwest, as in most agricultural regions, soil erosion is likely to affect water quality more than industrial chemicals. Your watershed's water quality assessment will include factors such as sediment, nutrients, pH levels, pesticides and herbicides, dissolved oxygen, water quantity, heavy metals, toxic substances, litter and rubbish, turbidity, and temperature.

Pollutants that enter the water body come from two types of sources: point source and nonpoint source pollution. You will encounter these terms in government and agency reports, so it is a good idea to understand and use the terms correctly. "Point source" pollution refers to fixed sources that have pipes directly into a body of water: for example, sewage treatment plants, factories along a river, and outdated tiles that dump poorly-treated household sewage into a stream.

"Nonpoint source" pollution refers to sources with no fixed outlets, such as runoff from urban areas or suburban neighborhoods, streambank destabilization, farm chemical applications, agricultural field runoff,

find out what has already been done.

One of the

major problems

facing many

Illinois watersheds

is siltation in

the water.

and all chemicals which are carried by the water to the pond, lake, river, or groundwater.

While not as easily recognized as a pollutant, warmer waters discharged to a water body from factories or sewage treatment plants may be just as detrimental to the water quality as chemical pollutants. Also,

removing trees along
the river or water edge,
which reduces shading,
may increase water
temperature and thereby
degrade water quality.
One of the major
problems facing many
Illinois watersheds is

siltation in the water; among its many negative impacts, silt blocks sunlight, killing vital plant life and depriving fish and mussels of much-needed food sources.

The first step in researching water quality in your watershed is to find out what has already been done. This will include contacting the NRCS, the Soil and Water Conservation District (SWCD), and the Illinois EPA. Ask them if there are any plans or studies completed or currently underway. The Illinois EPA, in particular, has already gathered a lot of useful data to help you judge the water quality of your river or stream. As well as current data, they have historic data to help identify trends in water quality. The Illinois EPA reports water quality information in the Illinois Water Quality Report, which provides water quality data on Illinois surface and groundwater

resources. The Illinois EPA updates the report every two years. They also produce water quality fact sheets for each major watershed in the state. Contact the agency for a copy of the report, a water quality fact sheet, and any additional information they may have about your watershed. In addition, the Illinois EPA may have done an

intensive water quality survey of your watershed sometime in the past. Historical data on your watershed's water quality, if available, will enable you to identify trends. For example, has sedimentation along the river increased

dramatically, or has it stabilized? Has water quality declined or improved over the past decade?

The watershed fact sheet will provide you with general water quality information, a brief summary of local water quality problems, and an assessment of the resource quality. Although you will need some experience with interpreting water quality data to understand Illinois EPA reports, they are useful to help you identify both causes and sources of water quality impairment.

The Illinois EPA has specialists in nonpoint source pollution whose job it is to help residents in the area acquire and understand water quality information. It is well worthwhile to get the name of your regional representative from the headquarters office, and ask for help.

WORDS TO KNOW

pH Levels:

The level of acidity. An increase or decrease in acidity outside of the normal range creates a habitat unsuitable for the naturally occurring mussel and fish populations.

Dissolved Oxygen:

The amount of gaseous oxygen dissolved in water.

Heavy Metals:

Natural metallic elements such as lead, copper, zinc, cadmium, and nickel which can accumulate in water and biological tissues. These elements are often found in elevated concentrations in industrial, municipal, and urban areas and can pose toxicity risks to living organisms.

Turbidity:

The cloudy or muddy appearance of normally clear liquid caused by the suspension of particulate matter.

Understanding the habitat is important because the present state of the habitat directly affects

WORDS TO KNOW

Channelization:

Deepening, widening and/or straightening a channel of the river or stream to increase its water carrying capacity. Loss of riparian vegetation usually occurs.

Soils and Geology

Throughout most of Illinois, the legacy of the glacial age remains a major influence on the state's soils and geology, and therefore on your water resource. When the glaciers retreated, they deposited silt, boulders, and other glacially-transported materials throughout riverbeds, lake's, and other areas. Their massive power determined the land's topography: glacially-created moraines (ridges) remain prominent features in many watersheds, determining waterflow patterns.

Since sediment is one of the most important issues to address in Illinois watersheds, you will need to look at the soils and geology and how they affect your resource. The topography and types of soils in your region determine land use patterns. For example, flat areas with till soil will be in agricultural use, while steeper, rockier, forested areas may have been left undisturbed. The soils that comprise the banks of your river, lake, or stream affect the rate of erosion as well as the type of sediment deposited into the resource. Silt with a significant clay component, for example, may be resistant to water erosion and provide good conditions for tree growth. Banks with sandy soils, on the other hand, may be much more prone to erosion, and this condition will be easily aggravated by tree removal and channelization.

A lot of valuable information has been gathered about erosion rates on

agricultural lands. The NRCS is a good place to start looking for information; most counties have comprehensive soil surveys. In addition, the Illinois State Geological Survey (ISGS) has information available about the geology of most areas of the state, and can respond to your inquiry for information.

In 1982 the U.S. Department of Agriculture National Resource Inventory looked at erosion rates in terms of tons per acre, and gathered data throughout the state. Since accelerated erosion has a negative impact on both ecological and agricultural values, rural landowners have a vested interest in addressing the erosion issue. In addition, since bank instability affects flooding, it should be a subject of vital interest to all watershed residents.

Study Instream Habitat

To better understand your water resources, you need to look at existing instream habitat. The Illinois Natural History Survey (INHS) and Illinois EPA are both good sources for this information. You will need to supplement this information with field studies of your own. You may also want to contact the Illinois RiverWatch.

There are varying opinions on how much land should be included in the definition of instream habitat. It generally refers to any structure occurring in the water itself. It may

the plant and animal species that live in and around the resource.

also include adjacent land habitat (lake and river banks, etc.) that exerts an influence on the resource. Some use a quarter mile on each side of a river to define a river corridor. However, one could argue that you could include the entire floodplain in the instream habitat analysis.

Understanding the habitat, both in the river or lake itself and along the

Careful observation

of instream habitat

can also provide vital

clues about the

stresses that are

affecting the resource,

as well as possible

historical incidents.

banks, is important because the present state of the habitat directly affects the plant and animal species that live in and around the resource. Riparian vegetation, or trees and plants along the resource, are often vital to the health of the watershed. For

example, woody debris - tree branches, logs, etc. - is often vital to the animals that live in the water. Fish and other invertebrates may use it to hide from predators or protect themselves from the current, and some invertebrates live in the debris itself.

There are many more ways that instream habitat affects your water resource. For example, are there large boulders in the water? Is there a lot of debris and organic matter in the water? What kind of plants and wildlife characterize the riverbank or lakeside? What is the condition of the banks? Are they visibly eroding, or do they seem stable? Are they steep, or gradual? Are trees growing right next

to the water? Are the stream's channels relatively straight, or do they curve and meander?

Careful observation of instream habitat can also provide vital clues about the stresses that are affecting the resource, as well as possible historical incidents. If the river banks, for example, are steep and eroded, the river may be carrying more water

> volume at a faster rate than it has historically, causing it to deepen and erode its banks. Large, mature trees growing along a streambank may indicate that at least in that area of the watershed, the streambank is relatively stable.

WORDS TO KNOW

Floodplain:

A nearly flat area of land along the course of a stream that is naturally subject to flooding.

Habitat:

The region where a plant or animal naturally lives.

Collect Hydrologic Data

To understand your watershed, you must understand the basics of the "hydrologic regime." This term refers to the way water moves through the system. Surface waters evaporate and become clouds, which in turn release rain or snow (precipitation). While nearly 90 percent of water falling back to earth returns directly to the oceans, the remaining ten

A high diversity of species ... in a watershed can be an important goal, since a high level of diversity

WORDS TO KNOW

Wetlands:

Areas which at least periodically have standing water, and which have soil types and plant growth typically found in saturated conditions.

Infiltration:

The gradual downward flow of water from the soil surface into the subsoil.

Percolation:

The downward movement through the subsurface soil layers to groundwater.

Evapo-transpiration:

The diffusion of water vapor into the atmosphere from a vegetated surface. Part of the water cycle, refer to page 26.

Sedimentation:

A broad term that embodies the process of erosion, transportation, deposition, and the compaction of sediment. percent falls over land. This water either soaks into the soil (infiltration or percolation), evaporates from the surface, or transpires through plants (is lost through openings in the leaves). We often combine the last two processes (evaporation and transpiration) into the term evapotranspiration.

In pre-settlement times, much of the precipitation falling in your watershed would have infiltrated and percolated slowly through the soil, and transpired through plants before it reached the river, or was absorbed in wetlands. Due to land use changes, that water now goes quickly and directly to the river, through channels, ditches, farm tiles, and storm drains. So not only is there more water in the river, but it is flowing through at a much faster rate. Since flooding is a function of speed, velocity, and quantity, flooding is more severe now than it would be in an undisturbed watershed.

The U.S. Geological Survey will be able to provide historical and current information on your watershed's stream flow. For many decades the USGS has maintained water monitoring stations along rivers or within watersheds. The USGS has set up a home page on the Internet (http://h20.usgs.gov) which contains useful information. You can retrieve, for example, satellite data on that day's rainfall and stream fall, and make historical comparisons of rainfall vs. stream flow at particular gage stations in your watershed.

It is important to understand that the stream flow in your river is closely related to sediment load. **Sedimentation**, which is the result of soil erosion, can be traced to urban and agricultural land use patterns. Again, urban and agricultural drainage systems move water into the river much faster, causing increased velocity of water moving through the river, particularly after storm events. The fast-moving water can cause high levels of soil erosion along the banks of the river, depending on the banks' soil types. The accompanying graphs, which demonstrate the relationship of sediment to discharge, and rainfall versus stream discharge, demonstrate this link.

In addition to contacting the USGS, you should also contact the Illinois State Water Survey (ISWS) to see if they have done any in-depth studies on your watershed in the past. Much of the data in reports like these is highly technical, and you will need experts in the agency or your technical advisory team to help you analyze the data.

Study Aquatic Populations

The fish, mussels, and insects in your river can provide vital clues about the watershed's health. For example, many of the more sensitive fish and mussel species may have declined or disappeared, while species that are more sediment-tolerant may have become more prevalent. Specific examples include the slippershell

indicates a healthier water system for both aquatic life and humans.

mussel, a species that needs clean, sediment-free water to survive. The slippershell has declined drastically in many Illinois waterways, whereas species such as the white heelsplitter mussel, which is more tolerant of lower water quality, are increasing. A high diversity of species – including fish, mussels, and aquatic insects – in a watershed can be an important goal, since a high level of biodiversity indicates a healthier water system for both aquatic life and humans.

Information on fish and mussel

species in your river is available from the Illinois Department of Natural Resources (IDNR), and the Illinois EPA can provide information on invertebrates. In addition, the Illinois Natural History Survey (INHS) keeps historical

records of fish, mussels, and insects, which will give you a standard of comparison over the years and a way to identify trends. We suggest you get expert help and compare the population composition over time.

In addition, if possible, it may be worthwhile to contact an aquatic biologist at a local university. They may have information that will be helpful to you, and may be willing to serve on your technical advisory committee. They can also help you analyze the information you retrieve from the Illinois EPA, IDNR, and INHS.

Study Land Use Along the Watershed

Knowing the land use practices – both historical and current – along your watershed is critical to identifying trends and developing solutions.

Data sources that may prove useful include aerial photographs at the University of Illinois

Library, information from the Illinois Natural History

Survey (INHS), USDA Farm

Services Agency maps, and

Knowing the land

use practices ...

along your watershed

is critical to

identifying trends

and developing

solutions.

U.S. Geological Survey topographic maps.

Availability of aerial maps varies.

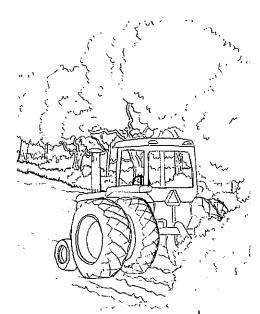
Most local universities maintain maps such as these, and their research department can help you

locate them. By looking at aerial maps, it is not only possible to look at land use changes, but also to look at how the river has changed over time: whether it has been channelized, whether its path has changed, and the amount of vegetation along the banks. USGS topographic maps and old plat maps are also useful in this endeavor.

The Natural Resource Conservation Service (NRCS) and local Soil and Water Conservation Districts may be able to help you find information about land use in your area. They can tell you how much acreage in your area is currently under the



... with such a wide variety of impacts and factors to consider, finding solutions is a complex task.



Conservation Reserve Plan (CRP). Under this program, farmers receive grants to take farmland out of production for 10 to 15 years and place it in conservation plantings. They may also be able to tell you about "best management practices" currently in use in your area, as well as soil erosion rates and cropping practices.

The ISWS, INHS, or the USDA may also be able to provide statewide GIS maps showing important information about your area. In addition, USDA conducts transect surveys by county which provide rough estimates of how many acres are planted in corn, beans, and other crops.

In addition, the NRCS's state office conducts a land use survey every five years in each county. Surveyors go to certain designated points and document land use changes in that area, such as changes in crop plantings and new subdivisions. Contact the NRCS, and find out if they are willing to help you break down the data to fit your watershed boundaries. The NRCS and Soil and Water District consider it their mission to serve local landowners, and could serve as an invaluable resource as you gather your initial information and work to build your watershed protection effort. The NRCS staff also recommend that citizens considering initiating a watershed protection effort acquire a series of brochures and video

from the Conservation Technological Information Center called "Know Your Watershed."

In Conclusion

Now that you are familiar with your watershed, it's time to move on to the next step: searching for solutions and developing action plans. Clearly, with such a wide variety of impacts and factors to consider, finding solutions is a complex task. There is no "quick fix" when it comes to writing a watershed management plan. However, a committed watershed protection team can develop practical, cost-effective solutions. We will now discuss how to accomplish that goal.

Chapter 3 Develop a Plan of Action

"It's natural human behavior to look at just your stretch of property and not really focus on what impact you have on others or that other people have on you. But understanding the whole picture is like putting together a puzzle – if you have just a small piece of the puzzle you're not going to understand the whole thing. So the process – which I think has been really exciting – has been that we've gotten together, combined our own little pieces of the puzzle, and now we're really beginning to understand how the watershed works."

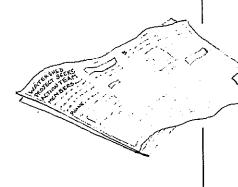
Mary Jo Adams, Mackinaw River Project Executive Committee and Education Action Team Member

n Chapter 1, "Build a Watershed Protection Team," we briefly discussed forming action teams to address each issue in your team's strategic plan. Action teams perform the nuts and bolts of watershed management planning: they are the ones who must come up with creative solutions to the problems at hand, and develop a practical way to protect and care for the water resource. Their task is to figure out how to translate the planning team's vision – as outlined in the strategic plan – into a reality. In this chapter we will endeavor to give you the basic tools you need to undertake action plans.

Recruit Action Team Leaders and Members

Action teams should consist of between eight and 12 members; large enough to allow for diversity, but not large enough to be unwieldy. Each team should include at least one planning team member to help keep communication lines open between the action teams and the planning team. You may recruit action team volunteers using the same strategies you used to recruit planning team members, including flyers, newspaper advertisements, and word-of-mouth.

Just as you strive for a diversity of interests on the planning team, you should strive for diversity on each action team. The action plans will eventually need approval from the entire planning team, so it's best if they can "pass the consensus test" within a diverse action team first. In addition, each action team should include healthy "expert" representation:



It is vital to take a comprehensive approach to watershed protection and restoration, since

for example, if you are forming a team addressing agricultural issues, it should include agency representatives, such as employees from NRCS, IDNR, and the Farm Bureau, as well as the agricultural producers.

Since water quality problems and conditions will vary widely within your watershed, solutions to these problems must be flexible and vary according to local sources of pollution. This is one reason why geographical diversity within action teams is important. It is vital to take a comprehensive approach to watershed protection and restoration, since what may benefit local residents may negatively impact the water itself. However, within the context of that holistic framework, locally-based strategies are essential for success. Geographical diversity, while it does make organizing meetings more complicated, will help ensure your action plans are both holistic and flexible.

Potential volunteers need to understand that serving on an action team is a major commitment. As an action team member, they will face many challenges, but they will also have the satisfaction of knowing that they have played a concrete, lasting role in their water resource's story. They will likely invest more than 40 hours over a period of four months before completing work on the plans, and they will need to attend meetings at least once a month. The team may also ask them to do research, requiring extra hours of work. Members should

be people who are willing to effectively express their views, make decisions by consensus, and subordinate their own private and special interests to the good of the project plan. They must participate actively without attempting to dominate or manipulate the group. Remember, the plan will only be as good as the people who create it.

Having effective action team leaders is absolutely critical: they are ultimately responsible for assuring their teams' action plans will successfully implement the assigned strategies. The team leaders' time commitment will be significant – at least 60 hours over a four month period. Because of the hefty work load, you may want to consider co-leaders. It will be extremely helpful if one of the coleaders is knowledgeable about the subject at hand, and has ready access to information resources. At the same time, they must be open to new ideas. All leaders must be knowledgeable about the strategic plan. Since the leaders must also be capable of coordinating a group process, organizational and interpersonal skills are a necessity. Through the consensus process, they will need to encourage all group members to participate, and help create an environment where team members feel free to introduce creative, non-traditional, and even unpopular ideas.

It would be well worth your while to spend time carefully interviewing potential action team leaders. (This might be an appropriate job for key



what may benefit local residents may negatively impact the water ...

members of your executive committee.) Approach the task as you would if you were hiring for any important position. The success of your action plans, and ultimately the watershed management plan, rests with effective action team leaders. You need more than people who look good on paper; they must have good interpersonal and leadership skills as well. Time spent interviewing action team leaders now will help you avoid awkward political situations and substandard action plans. And once the plan is completed, these people will be important supporters, ready to fight for its

implementation.

The success of your action plans ...
rests with effective

action team leaders.

Train the Action Teams

Your facilitator or project director should provide training for the action team and action team leaders before they undertake work. This step is absolutely critical, since you don't want action teams to become demoralized as they struggle to find direction. If your team members understand very clearly from the outset what will be expected they are much more likely to meet with success. We also recommend that you familiarize the teams with methods of running meetings and the consensus decision-making process. In addition, giving them a sample action plan that includes the essential elements timeline, cost estimates, etc. - would be very helpful. Be sure to review the water quality problems that you are

working to address. You need to ensure that everyone agrees on the major problems in the system, so that your team does not spend time developing plans to address different issues.

As the action teams begin work, try to facilitate communication between action team leaders. This could involve providing opportunities for action team leader meetings or encouraging phone communication so they can share ideas. A lot is expected of them, and they may benefit from sharing their early experiences as they

become more comfortable with their roles. In addition, there will likely be some overlap in action plans; for example, a team in charge of municipal

programs will likely want to know about public education programs the education team is developing. Especially in the early stages of action planning, the project director and/or coordinator should maintain regular contact with action team leaders to provide support, communication, and guidance if necessary. Clear instruction and guidance up front will save time later.

We highly recommend you use the consensus process for decision-making to write and approve your action plans. As discussed in Chapter 1, most of us are used to an adversarial system of decision-making. Through the consensus process, action and planning team members are



... identify the best methods of getting information,

and developing solutions – not just advocating for or against a particular view. Since you are writing a voluntary watershed management plan, you will want to make sure that diverse viewpoints are fairly represented in the plan, and this is exactly what will happen through the consensus

responsible for making compromises

Develop Action Plans

process.

The action team process is summarized below. It includes the following basic steps: Analysis, Research, Action Identification, Rating by the Planning Team, Writing, Cost-Benefit Assessment, and Presentation of Action Plans. The entire process will take at least six months and will involve monthly or bi-monthly meetings.

1) Analysis

Before the action team can conduct more research and brainstorm solutions, they must ensure they have a clear direction. This means taking a careful look at the strategy the planning team has assigned them, and analyzing what the planning team intended when they wrote the strategy. What does the strategy mean? Why is it in the plan? What are the plan's objectives, and how will this particular strategy help achieve those objectives? While they do not have the option of rephrasing the strategy, the team may wish to speak

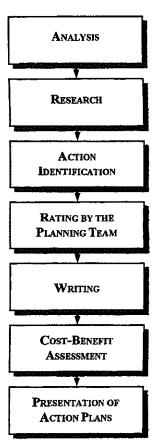
to members of the executive committee or planning team if clarification is necessary. Once the team understands and agrees upon the strategy and what is expected of them, the rest of the steps will fall into place.

2) Research

Now that the team members agree on the strategy's intent, the next step is to gather information. To identify and organize research topics, it may be helpful to first envision the strategy completed. Then, the team can work backward from there by identifying obstacles or problems they must solve before the planning team can implement the strategy. For example, if the team's assigned strategy is to enlist the participation of municipalities in controlling pollution, what are the obstacles the team foresees in implementing that strategy? The team will need to investigate the pollution sources themselves, their impact on the water resource, and regulations currently in place. Obstacles to obtaining the municipalities' participation in controlling those sources might include funding, resistance, and lack of education. If other action teams are also addressing the topic at hand, they may need to hold a multi-group meeting to inform everyone and divide up tasks.

Once the team has identified and organized the obstacles and problems, it will probably need to gather additional information and perform some data analysis. One way to tackle

THE ACTION TEAM PROCESS



including interviews, field trips, or guest speakers.

Clear instruction

and guidance

up front will

save time later.

this task is to have a brainstorming session to identify information resources. As you generate the list of potential sources of information, you should also identify the best methods of getting that information, including interviews, field trips, or guest speakers. You can then group research questions by information resource, making it easier to assign research tasks. For example, if the team wants more information on land usage within the watershed, and it identifies the National Resources Conservation Service (NRCS) as a potential source for this information, it can then assign

one individual the task of working with the agency to gather and analyze the data. If you have an NRCS representative on your committee, that person

may be the obvious choice. Be sure to give the volunteer a deadline on when the group needs the information.

Remember that there are likely a lot of data on your water resources already available from different agencies, including the Illinois EPA, the IDNR, the NRCS, and local Soil and Water Conservation Districts. (See Chapter 2: "Learn About Your Watershed.") The planning team used the initial information to write a strategic plan and decide upon some very general strategies. Now that the action team is delving into the strategies in more detail, they may find a second level of information gathering and data analysis is necessary.

Once research assignments have been made, the next step is *investigation* – gathering the information necessary to answer all initial questions. Finally, each person or subgroup *compiles*, analyzes, and summarizes the information gathered. The entire action team will need to hold a meeting to compare conclusions from each investigation, then compile the information.

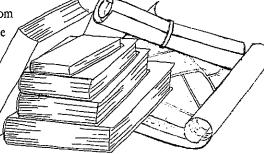
3) Action Identification

Now comes the most challenging task: boiling

down an overwhelming amount of information, and deciding what events must take place to implement your strategy. Before writing detailed action plans, it is

imperative that your team come to a consensus on what kind of *results* or objectives are absolutely necessary for success.

For example, suppose an action team's assigned strategy is to improve the diversity of natural plant, aquatic, and animal communities within the watershed. As part of its early research, the team interviewed scientists about major threats to the native species. One of the most critical threats identified was loss of natural habitat. The team consequently asked one of the members to conduct research on how much of the land was currently in its natural state. The team met to analyze this data. The team came to a consensus that for their



Before writing detailed action plans, it is imperative that your team come to a consensus

WORDS TO KNOW

Brainstorming:

To engage in or organize shared problem solving.

strategy to be implemented successfully, some land in the watershed must be restored to its natural state. Now that they have come to a consensus on restoration as a critical objective, they can brainstorm on actions that would help achieve that result.

Let's look at another example. Suppose the planning team assigned another action team the task of stabilizing streambanks to decrease erosion and the resulting sedimentation in the river. The action team decided to ask different individuals to identify which sections of the river suffered the worst streambank erosion. They also decided it would be useful to identify streambanks that were not eroding, and identify characteristics stable streambanks had in common. After they gathered information on where erosion was and was not taking place, they met again and discussed causes of erosion. After looking at all of the information, they conclude that some factors are critical to stable streambanks, including vegetation along the riparian zone.

Once an action team has come to consensus on a set of specific results or objectives, they can begin brainstorming actions to achieve them. Once again, it may be useful to think in terms of obstacles: what are the problems that must be solved to achieve your objectives? In the example used above, obstacles to restoring vegetation along stream banks may be agricultural practices, or perhaps some stretches of the river are so severely eroded that planting vegetation would be impossible. Now, the team's job is to brainstorm innovative ways of surmounting those obstacles. Potential actions might include educating landowners about best management practices, and securing funding for farmers wishing to implement those practices. To address the problem of severely eroded streambanks, they may need technical experts to help them brainstorm.

In another example, suppose an action team has been assigned the task of reducing the amount of untreated sewage flowing into their water resource. Through the research process, they have determined that to achieve this goal, some small municipalities in their watershed must install or upgrade sewage treatment facilities. The obstacles to making this happen in small, rural municipalities include money, engineering capabilities, fear of regulation, and lack of motivation. Now, the team's job is to brainstorm innovative ways of surmounting those obstacles. Potential actions might include educating the public about the problem and identifying funding sources for upgraded sewage treatment facilities. Actions for reducing stormwater runoff might include introducing innovative, low-cost programs to create "holding areas" such as soccer fields that double as wetlands during high rain periods. It may be helpful at this stage to invite speakers from other organizations addressing water quality issues, and ask them to discuss

on what kind of results ... are absolutely necessary for success.

how their group addressed similar obstacles. This is a good time to make sure the action team has a stakeholder representing the municipalities' interests. If not, it's not too late to ask someone else to join the team; it will be difficult to get good, realistic solutions without representation.

Creative brainstorming is a critical component of the action team process. The action team leader should encourage the team to be innovative, and to look at both conventional and unconventional approaches to surmounting obstacles

Creative

brainstorming is a

critical component

of the action

team process.

to their strategy's completion. The leader or co-leaders should foster an atmosphere where members feel comfortable bringing up new ideas, and do their best to prevent

premature judgment of those ideas.

4) Presentation of Initial Plans to Planning Team

Before fleshing out the plans in detail – conducting more research, developing cost/benefit analyses, and writing detailed steps for each action – the action team should present the list of results and actions to the planning team for consideration and ranking. That way, the action teams can avoid expending energy on actions that the planning team finds inappropriate or low priority. A full-day planning team meeting should be scheduled to accomplish this task.

This step, while time-consuming, will avoid later difficulties in achieving consensus at the planning team level on the final action plans. Once action team members have worked to expand their recommended actions to include detailed action steps and cost-benefit analyses, the stakes will be much higher for them. At that point, they will have expended considerable energy on each idea, and may greatly resent being asked to drop or significantly modify some aspect of their work. If rankings are done at this early stage, however, and the action teams understand the planning team's

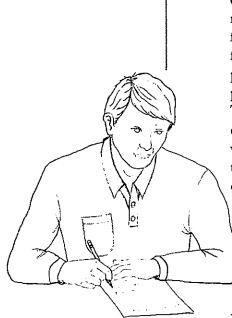
reasons for dropping or modifying a particular action, the road ahead will likely be smoother. At the same time, if an action team feels strongly about a "dropped action," they can do more research

and re-submit the information to the full committee.

Several weeks before the planning team meets for the initial rankings, the action team leader should prepare a concise document describing the results and actions their team believes are necessary to achieve their assigned strategy. (To make things as easy as possible for the action teams and planning team, the action teams should be given a format to follow when preparing the report.) At the planning team meeting each action team leader should provide a 20 minute presentation of their plan, and explain the reasoning behind their



The action team leader should encourage the team to be innovative, and to look at both



recommended actions. A 10 minute question and answer session follows each presentation. The planning team members should only ask questions for clarification; this is not the time for evaluations or debate. Once the presentations are complete, the planning group can rank each action. The rankings should include explanations, so that the action team will understand the reasoning behind them. (Note: to keep matters objective, action team members who are also planning team members should excuse themselves from discussions of their team, and should not be involved in ranking the actions.) Among other things, the planning team should look at whether the action is consistent with the planning team's stated mission and beliefs. For example, if the planning team's strategic plan states that all actions in the Watershed

Along with ranking the recommended actions, the planning team should identify any major gaps or overlaps they see in the action plans, and may recommend that the action team conduct further research. They may also modify specific results or actions.

. Management Plan must be voluntary,

they will decide not to pursue any

action that seeks government

regulation as a result.

Once the planning team has come to a consensus on the rankings and comments, they should be recorded and sent to all action team members. The information should also be sent to the technical advisory committee. Each action team should then organize a meeting to discuss the planning team ratings, and prepare for the next step: writing the action plans.

5) Writing

Now that the planning team has come to a consensus on which actions to pursue, the action teams are ready for the next step: writing the set of action plans to achieve their assigned strategy. Since the action team has a clear vision of the results that must take place for the planning team to implement the strategy, they will probably find that the action steps will fall naturally into place.

Typically, work on each action plan is roughed out by subgroups or individuals, who then bring their work to the whole group for feedback, suggestions, and ultimately, consensus. Each action plan consists of a series of action steps written to achieve a desired result or objective; for example, improved municipal sewage treatment, streambank stabilization, or reduced stormwater runoff. Information included in the plan should include the type of action (e.g., technical assistance, educational, incentives), responsibility (who could best implement the plan), potential for public support, effectiveness, and timing. To keep the action plans from becoming unwieldy or overwhelming, each action plan should be designed so that one person could move ahead with implementation simply by following the action steps. (The planning team

conventional and unconventional approaches to surmounting obstacles.

will determine personnel assignments later.) As they write the plans, the team may find that they need to break some actions down into smaller plans.

6) Cost Benefit Assessment

The team should prepare formal costbenefit assessments after writing all of the action plans. Benefits for each plan outline the positive consequences of implementing the plan - the contribution it will make to achieving the watershed management team's mission. Examples of benefits might include reduced sediment discharge, habitat restoration, or stormwater retention. Costs are the allocation of resources necessary to implement a given action plan. They include outlays of money, time, materials and other less obvious costs such as stress and political pressures. The team should identify potential sources of funding for the action. Another important part of the cost benefit analysis will involve identifying programs that are already doing the job, and assessing their contributions. The cost-benefit assessment is the action team's projection of the positive and negative consequences of implementing a particular plan. The team should do a thorough job of assessing costs and benefits, since the planning team will rely heavily on them when deciding which plans to implement first. Most watershed planning teams will be operating on a very limited budget, and cost-benefit assessments are critical in helping them get the most for their money.

7) Presenting the Action Plans

Finally, it's time for the action team to present its plans to the planning coordinator for distribution to the planning team. It would be helpful to include a cover letter and contents page that introduces the group's work. As with the preliminary rating session, all plans should be sent to planning team members for perusal two weeks before the planning team meeting. It may be helpful in premeeting preparation if a project coordinator divides the planning team into subgroups, and asks members of each subgroup to study a particular action plan in more detail then the rest. It may also prove helpful if the project coordinator writes a summary of each plan for the planning team's consideration. This summary should identify any overlaps between action plans; the planning team should be prepared for multiple teams bringing multiple action plans

A planning team meeting should be scheduled over the course of a day and evening to evaluate the plans. The procedure followed will be the same as the procedure in the first presentation: first, the planning team will hear the action team presentations. The presenter should summarize the plan instead of giving a detailed description of what each plan includes: they should give compelling rationales for the recommended actions, and explain why the strategy should be completed

before the committee.

Before putting the action plans to work, the planning team needs to review

WORDS TO KNOW

Conservation Targets:

Quantifiable objectives a planning team can use to help prioritize action plans and later assess the success of their plan.

in the way described. The planning team will not evaluate or debate the plans until all the presentations are complete; they are only there to listen and make clarifications at this point. (If the team is truly committed and involved, the facilitator will have his or her hands full keeping the group from debating and evaluating at every turn.)

After the presentations, the planning team can break up into the subgroups that were assigned before the meeting, discuss their assigned plan, and come to a consensus within the subgroup. The planning team then reconvenes, and each subgroup gives their results to the entire planning team for approval. Once the plans have been evaluated, the planning team will give their ratings to the planning coordinator, who will inform the team leaders of the results.

Identify Gaps and Overlaps in Action Plans

Ideally, your action plans will be complete and ready to put into action. However, we must consider the possibility that one or more of the action plans needs additional work.

There are several ways for the planning team to handle this

possibility. One way would be to return the action plan in question to the responsible action team and ask them to do additional work. However, since you are working with volunteers, this may not be a feasible or desirable alternative. Another way to handle this possibility is to appoint a special sub-committee of the planning team to fill in the gaps. You may even want to make this a permanent committee, with the sole function of improving and updating action plans as you begin the implementation process. This committee can draw from the planning team's resources as needed. As you will see in Chapter 5: "Evaluation and Follow Up," successful watershed management planning is a neverending process. The team will need to make many adaptations to action plans as the work progresses and they learn from experience.

Set Measurable Conservation Targets

Before putting the action plans to work, the planning team needs to review each of its objectives and set specific measurable conservation targets. Conservation targets are quantifiable objectives the team can use to help prioritize action plans and eventually evaluate the success of their watershed plan. Through conservation targets, the team uses

each of its objectives and set specific measurable conservation targets.

the knowledge it has gained through the course of the planning process, as well as information provided in various action plans, to articulate constructive opportunities for work and progress. Targets should correspond with the objectives listed in the strategic plan.

For example, if streambank stabilization is a major concern, one of your conservation targets might be stabilizing 10 miles of eroding streambanks over the next

five years. Other targets might include reducing sediment load, increasing the number of a specific species, or a percentage increase of agricultural

land in conservation farming. Look to your past research and analysis and reports you have gathered for ideas on water quality goals - for example, periodic EPA reports may provide a natural yardstick for measuring water quality improvements. Don't forget to consider nonpoint source pollution in your target-setting. While improvements may be more difficult to quantify, the Illinois EPA can help you find creative ways to do so. You will need technical assistance in setting these targets, since in most cases you will be relying on agencies to provide the data on which you will base your targets.

While setting targets, consider critical use of your resource. For example, if a particular section of your resource is used for drinking water, then targets addressing water quality in that section may be higher than other sections. Or, if you would like to improve a certain area in your resource as a fishing spot, you might want to set targets involving fish populations in that area.

In "Chapter 5: Evaluation and Follow Up," we will discuss how to use the targets to evaluate the

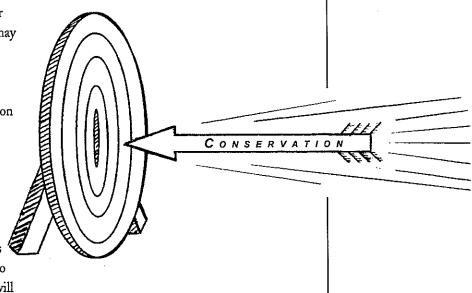
While setting

targets, consider

critical use of

your resource.

plan's success and adjust action plans accordingly.





Chapter 4

Protect and Restore Your Water Resource

"You can't fight the river ... you have to manage it in response to the conditions imposed by today's society."

Kevin Coulter, farmer and Chairman of the Mackinaw River Executive Committee

ost everyone who becomes actively involved in watershed management shares a love of the outdoors. Whether they grew up farming by a river, taking weekend hikes, or vacationing by a peaceful lake, they feel a connection with the land. Sometimes it's hard to translate that spiritual connection to the long and challenging watershed management planning process. Yet, if we are to care for our resources responsibly, careful thought and planning are essential – anyone serious about watershed management must learn to do it. Here's the good news: now that the planning stage is nearly complete, the more glamorous work begins. The team is entering into a truly exciting stage of watershed management planning: *implementation*. Now that the action teams have described how to do it, the planning team just has to decide how much and where. Then, they will experience the joy of seeing the hard work pay off. All of that careful planning will reap large benefits, since all of the implementation work will already be well researched and carefully targeted.

Some of the benefits will be immediate, and some will be long-term. The plan will not be completely implemented for many years. It took many years for the watershed to get to the point it is now, and a good, holistic watershed management plan will not be implemented overnight. The good news is this: watersheds are notoriously adept at self-cleaning when given the opportunity to do so. The team's job is to implement

management techniques, both low-tech and hi-tech, to allow the resource's natural processes to help achieve the plan's objectives. Although the watershed cannot return to pristine conditions, with help it can function

The plan is much more likely to meet with success if it targets some key sites or subwatersheds

WORDS TO KNOW

Self-cleaning:

Watershed

Natural processes that function to remove nutrients and sediment from a stream.

in a healthy way in today's changed world. And if you listen to it carefully, your resource will be your best ally in the years ahead.

How Much and Where

Throughout this manual, we have advocated a holistic, comprehensive approach to watershed and water resource management. This approach should carry through to implementation. If yours is like most watershed management teams, though, financial resources will be limited, and you cannot implement all of the action plans at once. However, using a practical approach to organizing, prioritizing, and applying action plans, the team can target the available resources to specific sites, while working toward long-term, watershed-wide objectives. In this section we will present ideas to help your team make the tough decisions ahead.

Every watershed is made up of smaller, distinct "subwatersheds," each with a different land use and

> habitat type. If your resource is a river, for example, you might designate each tributary as a subwatershed, and divide major tributaries into upper and

> > lower reaches, depending
> > on the management
> > challenges involved
> > with each section.
> > Or, your watershed
> > might include lakes,
> > reservoirs, and
> > groundwater. The

plan is much more likely to meet with success if it targets some key sites or subwatersheds at the beginning and expands work from there.

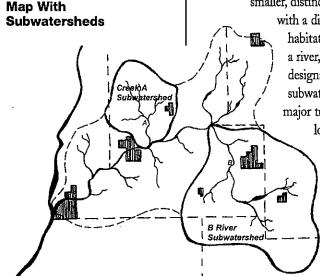
The team will need to decide how it wants to prioritize the sites, then select which action plans to implement first. Below we offer some factors to consider in the prioritization process.

Who Decides?

Logistics for completing the work ahead will have to be determined. Depending on the size of the team, it may not be feasible for the entire group to complete the detailed work required. Since they have all had input into approving the action plans, it may be time to let the executive committee take it from here. The executive committee will want to look to key planning team and technical advisory team members for assistance in the implementation phase. In addition, it may be worthwhile for the planning team to continue to meet once or twice a year throughout the implementation phase. Obviously, there will be a natural attrition within the teams, and the executive committee will have to occasionally recruit new members.

Protect Best Sites First

As your team decides where to begin implementation, there will need to be some give and take between ambitious watershed-wide action plans and site specific action plans. Ideally, there



at the beginning and expands work from there.

... it makes sense

to protect the

best sites first.

should be a balance between both. The team should begin laying groundwork and implementing watershed-wide objectives, such as public education, while at the same time tackling specific sites.

While it might be tempting to focus initially on the worst problems in the watershed, we believe if you are lucky enough to have high-quality sites in your watershed, it makes sense to protect the *best* sites first. There are several reasons we believe "protect the best first" works. First, when done correctly, protection costs a lot less than

restoration, both in dollars and labor. For example, if stormwater runoff control is an issue in your watershed, and you have an intact

wetland that is helping to hold water during heavy rainfall, keeping that wetland intact makes more sense than implementing expensive engineering solutions down the road.

Second, when protection and restoration efforts are initiated in watersheds, there tends to be a ripple effect. Suppose, for example, one of the action plans is a landowner contact program. Action steps include working with landowners to inform them about important natural areas on their land, and enlisting their voluntary cooperation in protecting those areas. In the course of your work, you discover that one of the landowners on your team has remarkably intact, stable streambanks on her land, and until she became

involved in the watershed planning effort, she was unaware of their value. As part of the landowner contact program, she works with your experts to maintain the streambanks; for example, she will not remove any vegetation, and will not begin cropping closer to the river. In addition, she is willing to post signs you have given her around her property. Her neighboring farmers and friends see the signs, and ask her about them. Some of them think about natural features on their own property, and decide to contact your group. Word of your program spreads

throughout the small rural watershed.

Another kind of ripple effect involves the best management practices

themselves. If your resource is a river, for example, then improving water quality upstream will have the potential to improve water quality downstream. Similarly, working in the upper reaches of the watershed to control stormwater runoff will alleviate streambank destabilization downstream. By focusing on key locations throughout the watershed, you can maximize both kinds of "ripple effects."

Finally, by protecting the best sites first, you provide models to use as guides when tackling the more highly-degraded areas in your water resource. By looking at factors such as species composition, water volume, and bank erosion in your best quality areas, you will be

WORDS TO KNOW

Streambank Destabilization:

The land along the river bank is eroding. This is usually caused by two interacting situations: vegetation along the top of the streambank has been removed (e.g., trees to prevent shading of cropland, trees and other vegetation so that farmers can plow as close to the streambank as possible) and there has been a significant increase in the speed and the volume of water moving down the river following a heavy rain.



Action plans essentially provide a toolbox the team can use to manage its watershed,

better able to judge the targets you should be aiming for in your more degraded sites. In addition, you will now have a showcase site where you can take potential participants and give them an idea of what you would like to achieve in the rest of the watershed.

Prioritize Critical Uses

While prioritizing implementation steps, it may be helpful to make a list of the primary beneficial or critical uses of each of your subwatersheds. Rank each of the uses in order of importance. If one area provides drinking water while another provides recreational use, you may decide that since public health is at stake, you will give the first site higher priority. Other uses include swimming, boating, wildlife habitat, aquatic habitat, and stormwater runoff management. Another consideration might be whether or not the local community is interested in the project; some action plans might be easier to implement where there is a receptive audience.

After deciding which factors to consider when prioritizing the sites, the team should review management objectives. Next, it will be helpful to create a prioritization grid listing the sites, the priority factors, and the major stressors. For example, you may want to prioritize by establishing a relationship between critical use, quality of site, management objectives, and stressors (See Table 4.1). In

addition, you will want to take into account other major issues in the watershed, such as stormwater runoff. Note that this only a sample – every watershed will have different priorities.

Decide Where Work Can Best Alleviate Target Stressors

Once the team has discussed conservation targets and has a good idea of which sites are highest priorities, you can begin looking at where the action plans can best alleviate target stressors. Let's use the site described in the accompanying table as an example. It provides drinking water for a major portion of the watershed, and is threatened by increasing pathogen levels. It ranks highly in both areas the team has decided to consider: quality of site and critical use. Factors at this site have only a minor impact on stormwater runoff in the watershed, so the team may decide not to focus major resources on those "anti-stormwater runoff" action plans at this site.

If your resource is a river, it may make sense to focus on upper tributaries and work your way down to the main channel. By alleviating pollution, stormwater runoff, and sedimentation sources in the upper reaches, you benefit the entire system. In addition, flooding problems can often be traced to problems in the upper reaches of a tributary.



with each plan describing a tool or management technique.

Site or Subwatershed	Subwatershed Factors			Stressors	Management Objectives
HENLINE CREEK	PRIMARY CRITICAL USES AND RANK		SITE QUALITY		
	Fishing	5	Excellent	sedimentation	streambank stabilization
	Drinking Water	1	Excellent	pathogens	improve municipal sewage treatment
	Habitat	1	Excellent	sedimentation, pathogens	streambank stabilization improved waste treatment
IMPACT ON STORMWATER RUNOFF			AREA IMPACTED		
1	Minor	4	Downstream Tazewell County	loss of wetlands, bank erosion agricultural runoff	reduce stormwater runoff

TABLE 4.1: Create a prioritization grid listing the sites, the priority factors, and the major stressors. In the example above, priorities are made by establishing relationships between critical use, quality of site, management objectives, and stressors.

Select Best Management Practices

Action plans essentially provide a toolbox the team can use to manage its watershed, with each plan describing a tool or management technique. Management techniques may be either structural (requiring an engineering design) or non-structural (e.g., educational programs.) The Illinois EPA, with whom you will be dealing with on many of these water quality issues, refers to such management tools as "best management practices," or BMPs.

Continuing with the example of the site described in Table 4.1, suppose you have determined that the major threat to this site comes from a municipality that is releasing untreated sewage into the tributary. Since municipal issues were addressed by the municipal action team, review their action plans and determine which ones would be most appropriate at this particular target site. The action plans should include recommended action steps for municipal sewage treatment, as well as cost/benefit analyses. Using this information, the team can decide which BMPs to implement first.

... beware of management practices

that solve a local problem while

While choosing best management practices to include in the watershed management plan, keep the big picture in mind. A good watershed management plan looks holistically at the set of problems affecting a given watershed. In the past, problems were approached on a chemical by chemical, source by source basis. The goal now is to look at multiple sources in the context of the entire watershed. Examine cumulative effects of stressors throughout the watershed, and work to transcend political boundaries and focus on natural boundaries instead.

We have already discussed the fact that some action plans may have a positive "ripple effect" on other parts of the watershed. Many BMPs have beneficial secondary effects. For example, a wetland not only serves to absorb waters during heavy rains and reduce stormwater runoff, but it also serves as habitat for wildlife. It also filters contaminants and improves water quality. Likewise, many agricultural BMPs not only help the water resource, but they conserve the farmers' resources as well.

However, beware of management practices that solve a local problem while negatively affecting other parts of the watershed. Many past efforts have fallen into this trap. For example, the formerly-popular practice of channelization – deepening or straightening a channel of the river to increase its water carrying capacity – has led to greater streambank

destabilization downstream in the watershed, less fish habitat, and a disassociation between the riparian trees and the waters that sustain them.

While prioritizing your BMPs, also consider the following factors: public and partner support for the BMPs, technological feasibility, funding availability, (you should find all of this information in the action plans), and the cost of inaction.

Consider Demonstration Projects

Demonstration projects can be a useful way of testing stakeholder reaction to BMPs while at the same time providing valuable public exposure for the watershed management plan. There are many potential funding sources for demonstration projects (see funding section).

To establish demonstration projects, first decide which best management practices the team would most like to implement throughout the watershed. Look to your objectives, and select BMPs that help accomplish them. Potential demonstration projects might include water detention and retention systems to reduce stormwater runoff, levee removal, streambank restoration, livestock management such as pasture infiltration improvement or fencing for rotational grazing, and wetland bio-filtration treatment of sewage from field tiles.



negatively affecting other parts of the watershed.

Once you have decided which BMPs to test and demonstrate there are two different strategies available, and each has advantages and disadvantages. You can either identify ideal sites for demonstration projects and approach specific landowners, or you can post flyers and newspaper advertisements announcing funding availability and asking for applications. The advantage to the first approach (identifying ideal demonstration sites and approaching the appropriate landowners) is that you will have greater control over the projects. The primary disadvantage is

that you will have to sell the idea to specific landowners, and you may not get as much participation. The advantages of opening the process up to the public include attracting more interest in your

project and gaining greater participation. In addition, you may get some good leads about important natural areas. If you choose this approach, however, be aware that opening the process up to the public will require a great deal of time and logistical work, and you may not get the chance to work on the best sites. Whichever approach you use, your executive committee should be responsible for reviewing and accepting applications. Demonstration projects should be judged on the following factors: compliance with strategic plan's statement of beliefs; the degree to which it meets the project's objectives; cost-effectiveness; eligibility for funding; visibility; public relations opportunities; and

geographic distribution (ideally, if your watershed includes multiple counties, there should be at least one demonstration project in each county). In addition, the executive committee should consider whether the BMPs demonstrated will have applicability in other areas of the watershed. It may be useful for the committee to prioritize the applications by ranking each project on a scale of 1 to 10 in each of the above areas, and giving it a total score.

... you will not likely find funding for your entire project in one place.

Locate Funding Sources

Many of your action plans may already include suggestions for funding sources in their cost/benefit analyses.

Now that you know which action plans you hope to implement first, they should provide you with some guidance as you identify funding mechanisms for implementation.

Obviously, you will not likely find funding for your entire project in one place. Different agencies focus on different aspects of watershed management. The Illinois EPA, for example, focuses on water quality, and may provide funding for BMPs addressing point and nonpoint pollution control. The IDNR may provide funding for forestry projects. The NRCS, SWCD, and USDA focus on agricultural and other land use practices. The recently passed Illinois Conservation 2000 Act,

WORDS TO KNOW

Rotational Grazing:

Process where a pasture is divided up into a number of paddocks. Each paddock is intensively grazed for two to three days. After this intensive grazing, cattle would be removed to allow for vegetative regrowth for three to four weeks. This practice increases the productivity of the vegetative forage and allows more protection against soil and water erosion.

While identifying funding sources, don't limit yourself

funding for many different types of BMPs and is worth investigating. It would also be well worth your while to talk to your elected officials at the local, state, and federal level, and enlist their help in finding funding sources in these agencies. Not only do they have access to agency decisionmakers, but their support lends credibility to your effort. (Note: exercise caution if you are working to secure funding for the entire plan from a single source. You may want to evaluate your plan to ensure it wasn't written solely to meet that funding source's criteria.) In addition to government agencies,

administered by IDNR, provides

In addition to government agencies, there are many private organizations and foundations that would consider proposals. The technical advisory team should have ideas about places to look. You will also find information on foundations and organizations at the public library.

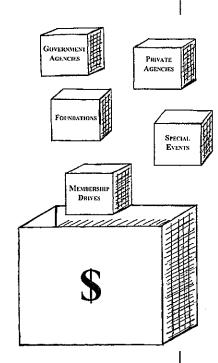
While identifying funding sources, don't limit yourself to the usual places - be creative. Consider approaching the Illinois Department of Transportation, for example, to help you with best management practices designed to reduce runoff from roadways. (Road salt, motor oil, and fuel runoff from roads are all nonpoint pollution sources.) You may also want to consider fund-raising events. In general, however, special events tend to be very labor-intensive in relation to the amount of money raised, so be careful about using them as a fundraising tool. Make sure the event

accomplishes important public relations objectives along with providing a source of income.

Some watershed management teams have had success raising money through membership drives. Using funds from the membership drive, the teams produce newsletters, which are excellent public relation tools.

Once potential funding sources have been identified, contact the person at each organization in charge of administering the program, and ask to set up an informational meeting. If that is not possible, ask them to send current information and application procedures. Once you know whether their guidelines suit your needs, you will need to submit a formal proposal. (There are books available from the public library that explain the proposal-writing process, if you do not have someone available with experience.) As you prepare the proposal, try to find out as much as you can about the agency's expectations, as well as projects they have funded in the past. This cannot be emphasized enough; the most eloquently-written proposal will not succeed without proper understanding of the funding source's interests and requirements.

Whether or not you are submitting a formal proposal, provide a copy of the watershed management plan to local, state, and federal agencies for their review and ask them to investigate whether their agency has financial and technical assistance available.



to the usual places - be creative.

The quick fixes

of yesterday are

among the worst

problems of today.

A surprising number of projects or portions of projects have been funded because a watershed management plan was in the right place at the right time.

Prepare for Implementation

Complete a Master Schedule

You are now ready to put together a master schedule. This task should probably be handled by your executive committee, since the task may be

too unwieldy for the

planning team. The planning team, however, should have input into major decisions. The schedule should include: a timeline outlining the sequence of events;

assignment of responsibilities; a budget; and likely funding sources. The schedule could be organized by

objective or by site.

The schedule should cover a number of years. We recommend setting major goals in five year increments; it may take a full 10 to 15 years to fully implement the plan, and it may take 20 years to achieve every one of your objectives. Some of the action plans will include lifestyle changes, and these kinds of changes do not happen overnight. Other action plan goals may be more straightforward, but will still require many years to implement. For example, if the team has identified 1,500 acres of wetlands to protect, it

may take 10 years to protect 50 percent of them, and 20 years to protect 90 percent. At the beginning of the planning process 100 percent can be achievable if time, effort, and community support is provided.

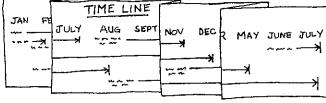
It may be difficult at first to think in terms of 10 to 20 years. But remember, the quick fixes of yesterday are among the worst problems of today. Instead of using band-aid solutions, strive to use active watershed management to complement natural processes. This takes a long time to complete, but the

benefits will last for generations.

Assigning responsibilities will sometimes involve identifying agencies, and will

involve identifying specific individuals. The best place to look for volunteers to carry out action plans will be in the action teams themselves. Many of your action team members will feel personally invested in the action plans,

and may be eager to play a role in their implementation. If the responsibility falls to an agency, review what you are



requesting, and if possible, assist that agency in locating additional resources to do the work. In some cases, you may find an agency employee who would like to help you, but is unable to secure organizational support. In that case, it may be helpful to contact his or her superiors and lobby for the

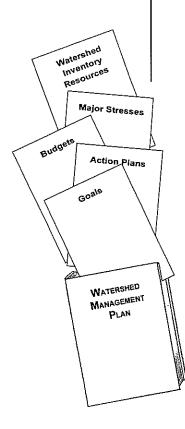
Being neighbors in a watershed means

understanding that what you do

WORDS TO KNOW

Watershed Management Plan:

A document originated by a community that identifies all natural resources, the problems impacting those resources, solutions for those problems, and opportunities within the watershed to improve the quality of life and the natural community, while meeting the environmental goals of the state and nation.



employee's time. Setting the implementation schedule and writing the plan are exciting steps in the watershed management process. This is where all of the meetings pay off and the action begins. And thanks to your careful planning, you will be accomplishing a great deal with much less effort than if you had not planned carefully.

Write Your Watershed Management Plan

Now that the planning is complete, you're ready to commit it to paper. Don't feel the plan must be perfect before it can be written; if you wait for perfection, you will lose momentum and the plan will never be completed. A good planning effort involves periodic evaluation and revision, and ideally you will be reviewing your plan annually. Any gaps can be taken care of through the follow-up process.

Ideally you will want to find a technical writer to commit the plan to paper, since much of the document will include technical information about your watershed. However, technical expertise is not a requirement. In general, a complete watershed management plan should include watershed goals and action plans, budgets for each action plan, identified major stresses within the watershed, and a list of watershed inventory resources. A watershed inventory consists of all of the information you have already gathered (see Chapter 2: "Learn About Your Watershed"). You will probably use narrative, maps, and

tabular data to present the information. It may include the following: location and size of watershed and subwatersheds; political jurisdictions; demographics; type size, location and uses of water resources, including rivers, lakes, groundwater, wetlands; land uses; land management considerations; floodplains; topography and actual drainage patterns; wastewater discharges; and other special resource features, such as fish, wildlife, and wild and scenic rivers.

The description of existing watershed management programs should describe current resource management roles and responsibilities in the watershed. It includes, for example, municipal and county ordinances for soil erosion and sediment control, stormwater, wetland protection, flood control, SWCD technical assistance, etc.

The watershed action plan should include the following: priority resource problems to be addressed, such as water quality degradation, stormwater runoff and flooding, and bank erosion; resource management goals and objectives; the master schedule with action plans and personnel assignments; anticipated costs and funding sources; and evaluation and maintenance plans.

Build Public Support

Since community support is absolutely critical to its long-term success, a

affects your neighbors, and what they do affects you.

... if you wait for

perfection, you will

lose momentum

and the plan will

never be completed.

successful voluntary watershed management planning effort must include a public outreach campaign. The team may decide to initiate the campaign well before the plan is complete to help pave the way for implementation. Before initiating the campaign, however, the team needs to identify primary messages, decide which groups to target, and determine the best strategies for reaching those groups.

When initiating a public outreach campaign, it may help to focus on three primary messages and keep

those messages in mind whenever you are developing a brochure, making a presentation, hosting a canoe trip, or talking with the media. This is especially useful during interviews. For example, three messages

for a public campaign might be:

1) "Our water resource is a source of pride and we want to take care of it for future generations"; 2) "This is an opportunity for all of us to take control of managing the resource instead of relying on a regulatory process"; and 3) "This project is about being good neighbors, and we take this value very seriously."

The term "neighbors" in this context means more than being friendly to others in the community. Being neighbors in a watershed means understanding that what you do affects your neighbors, and what they do affects you. To maintain a watershed with good water quality –

which benefits the entire community

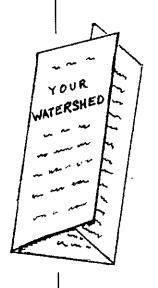
– we have to work together as
neighbors.

There are many utilitarian reasons for protecting a watershed. Some of these, such as maintaining good water quality for drinking water and preserving a recreational resource, may be obvious. Some may not be so obvious, however, and you will want to include them in your education campaign. If stormwater runoff and flooding are issues, for example, watershed residents may not realize that even if they aren't the ones being

flooded out, their tax dollars are going towards bigger bridge crossings, bigger storm drains, and other high-cost engineering efforts to handle the increased water volume. A big part

of your job in the outreach campaign is convincing stakeholders that they <u>are</u> stakeholders.

Once you've identified your primary messages, decide which groups in the watershed to target. If your effort is to succeed, it is absolutely essential that you identify key decision-makers and work to educate and engage them. You will be approaching these people with ideas for reducing pollution, improving sewage treatment, etc., or in the case of business owners, for private donations. If they haven't heard of you before you approach them with a request for help, your proposal may not get anywhere. On the other hand, if they already know



If your water resource is a river or lake, one of the best ways to get people excited

about your project, you will have a better chance for support and a larger donation. You must inform before you ask. Also, remember that without support from the general public, community decision-makers will not support you; they won't make investments or take public relations risks unless they think the community will support their involvement.

As you work to build a solid base of public support, some ideas for specific groups to target include local VIPs (politicians, major business owners, etc.), business organizations (Rotary Clubs, etc.), municipal representatives, media contacts, and school children. Remember, though, that in the case of a voluntary watershed management plan, the local citizens who use and rely upon the water resource comprise your most important audience.

You will need to prepare some informational materials for your effort, including a brochure, copies of any favorable press your project has received to date, a watershed fact sheet, a project fact sheet, a slide show, a portable display, and a project newsletter. Other useful fact sheets might include definitions of watersheds, water quality, and descriptions of aquatic life in the river. The executive committee should review materials to make sure they are

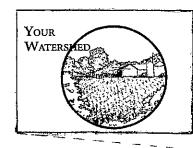
consistent with the mission and objectives of the organization.

If your water resource is a river or lake, one of the best ways to get

people excited about the project is to get them out on the resource. No brochure or slide show can take the place of gliding down a river in a canoe and seeing its virtues — and its problems — first hand. Consider sponsoring a series of canoe trips led by volunteers on your planning team.

You should develop an informational kit to give to VIPs and media representatives anytime you meet with them. It should include: all appropriate fact sheets; your brochure; any recent newsletters, and if appropriate, a press release. In addition, a vital component in your press kit will be a list of your planning team members, providing they have given you permission to do so. By listing your planning team, which consists of members of the community, you are demonstrating in real terms that yours is truly a community-based effort, led by their neighbors and peers.

Speaking engagements are another important tool in your public outreach campaign. Many groups, such as local Rotary Clubs, are looking for speakers, and are delighted when someone volunteers to present a program. If at all possible, a slide show is a critical accompaniment to your presentation; it's difficult to convey the virtues of a water resource without pictures. At each speaking engagement or presentation, emphasize that the project is community-based, and that you need volunteers and would welcome their participation and support. This is their



about the project is to get them out on the resource.

The children of your

watershed are the

ones who will inherit

the river and

community, their watershed, and their watershed management plan.

There are also many opportunities to set up booths at events in different communities around your watershed. Purchasing a portable display is prohibitively expensive for most watershed teams, but an able volunteer can build one for you.

One of the most powerful tools in your public outreach campaign will involve the children of your watershed. Just as local organizations are often eager to find speakers, local

schools are often delighted to invite you into their classroom for a presentation, or better yet, enlist your skills in managing a school project. (As an extra benefit, local newspapers

love to cover events involving schoolchildren.) Children are very environmentally aware, and once you educate them about the river, they will often express a desire to help in any way they can. Remember that providing hands-on experience is almost always a more effective teaching tool than lecturing.

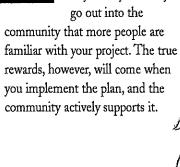
If you've managed to engage the children, parents and other adults will develop an interest in a way they might not have otherwise. Managing the resource for future generations, after all, is what motivates many people to take an active interest in conservation. The children of your

watershed are the ones who will inherit the river and drinking water, and the river's water quality is of great importance to them. A city council will be more apt to listen to a group of students presenting what they have learned than one resident or group representative. But be sure that when you use this strategy, you don't abuse it.

The success of your public education campaign may be difficult to gauge at first. However, eventually signs of your success will be evident; you may be surprised when a favorable editorial

> about your project appears in a local paper, or a local school may decide to have a cleanup day along the river without your prompting, or you may find as you go out into the

drinking water ...

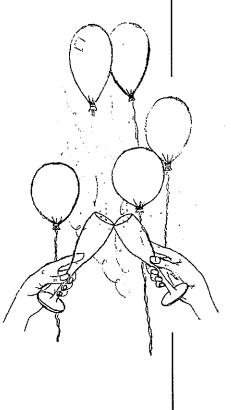




Chapter 5 Evaluation and Follow Up

"My hope is that we've set off a chain reaction whereby landowners take it upon themselves to make improvements to protect this river for their children and their children's children."

Jim McMahon, Mackinaw River Project Director, The Nature Conservancy



ompleting a watershed management plan is cause for celebration. It's important for your team members to take the time to reflect on the tremendous feat they have accomplished. They have surmounted their differences, put in hours and hours of volunteer time, and in many cases subordinated personal interests to pursue the common good. Thanks to their hard work, their watershed's future looks a whole lot brighter. Once the toasts and congratulations have been exchanged, it's time to move on and ensure that hard work pays off for decades to come.

Stay Organized

Now that the watershed management plan is complete, the planning team and action teams have served their primary purpose. However, the watershed management process is far from done. Someone needs to oversee implementation, periodically evaluate the plan's success, and ensure the plan meets its five, 10, and 20 year objectives. If you do not have a tightly organized structure to manage implementation, the plan will break down, and all your hard work will have been for naught.

There are many organizational options available to a watershed planning team, and the task force will need to consider each one of them, their advantages and disadvantages, and present their findings to the planning team at a later meeting. One of the most

... many of your plan's benefits may not be seen for another twenty years; it's important

important options they should consider is organizing as a nonprofit organization. An advantage of this option is that as a 501(c)3 organization (the IRS tax statute under which nonprofit organizations are organized), you can receive grants directly from government agencies, private foundations, and individuals. Otherwise, these fund-raising efforts must be directed and implemented through other public or private organizations, due to government agencies' limitations regarding eligible grant recipients. Furthermore, if you have nonprofit organization status, gifts from foundations and individuals will be tax-deductible. A 501(c)3 organization would probably require at least one permanent staff member or very dedicated long-term volunteers, so you will need to consider that as you investigate this option.

Continuity in watershed management is critical, and a formal organization helps ensure that continuity. People will come and go, but the organization will remain. As mentioned in the previous chapter, many of your plan's benefits may not be seen for another 20 years; it's important that an organizational structure be there to track those benefits.

A formal organization also lends credibility to a cause, and provides a

vehicle for membership and support. As you step up public information efforts and work to persuade stakeholders to "buy into" your watershed management plan, it would be tremendously helpful to have an organization available they can formally join or establish basic contact with.

If you elect not to form a 501(c)3 organization or fund permanent staff, you will need to designate a point person or small committee to manage the follow-up and evaluation process. This person could be an agency representative who has been very active in the process, or a small volunteer task force.

Until the team decides upon a structure, the executive committee can manage the continuing implementation process. But remember that in the meantime, securing funds from some sources will require additional coordination.

Develop an Evaluation Plan

In Chapters 3 and 4 we discussed setting conservation targets (quantifiable goals based on your objectives) developing implementation plans, and setting 10, 15, and 20 year goals. Your team needs to come up with a way to periodically evaluate the plan and

that an organizational structure be there to track those benefits.

adjust it as necessary. The plan should include questions you will need to ask, how to gather the information, how often you will meet to conduct evaluations, and who will make the decisions. Obviously, your group's organizational structure will in part determine the logistics of the evaluation process.

Focus on Measurable Objectives

If your team set measurable conservation targets related to objectives as discussed at the end of

Remember, action

generates its

own momentum,

and must be

tracked carefully

and objectively.

Chapter 3, much of the work necessary for effective evaluation is already done. If you have not yet set targets, do that now; an effective evaluation is not possible without quantifiable objectives. Even if you

have already set conservation targets, you may find through the evaluation process that you want to add more specific, quantifiable targets.

Determine Which Questions to Ask

The most obvious reason for evaluation is to keep track of progress and ensure you are accomplishing your goals and objectives. Other evaluation tasks include the following: clarifying roles of partners, volunteers, and other groups and

individuals responsible for implementation; providing ongoing feedback to those responsible for implementation; determining whether an action plan's benefits are worth the resources it is consuming; and making adjustments and finetuning action plans. Remember, action generates its own momentum, and must be tracked carefully and objectively. Some of your action plans may have unexpected effects on your watershed, and you need to establish whether the original action plan is still acceptable.

> There may be other questions your stakeholders have about implementation and its effect. Use plan objectives to keep the evaluation focused. For

member may have specific questions about the use of filter strips on agricultural land: how many are in use, and what motivated the landowners to use them. If one of the plan's objectives was to encourage the use of filter strips, this is an excellent evaluation question.

Important evaluation questions will include looking at the timeline. Are you meeting the timeframe you expected? If not, why not? Are there obstacles that your team needs to address? Does the timeline need adjustment? You will also want to

example, a team



The best of watershed

management plans will need

carefully examine whether or not responsible parties, including agency partners and volunteers, are implementing their action plans as promised. If not, why not?

As you determine your evaluation questions, you may want to consider critical use in different areas of your resource. For example, if one section is used for recreation, you might consider finding out if more people are using it. If another area is used for drinking water, you will obviously want to pay particularly close attention to water quality monitoring in that area.

You may also find that because of your success in drawing attention to your watershed, other private and public groups and individuals may have taken action on their own, and these actions may affect your watershed and watershed management plan. If your efforts to involve local schools and communities in the project have been successful, for example, some of these groups may have organized their own clean-up projects.

The most important overall questions you will ask yourselves are the following: Was our project successful? Are we meeting our objectives? What impact has the project had, and how could we change the project to make it better?

Collect Data

Once you've determined what you want to ask and what your targets are, you will need to collect evaluation data. You will want to use your technical experts to help you with this task. Much of the information you will need for ongoing evaluation will be available from agencies working in your watershed. For example, you can look to periodic Illinois EPA surveys for water quality evaluation and habitat changes, IDNR for periodic fish surveys, and to the USGS for changes in water volume.

You may also want to consider more innovative ways of evaluating your success. Some objectives, such as educating the public about the watershed, may seem a bit nebulous; however, there are ways of judging success. Public polls, for example, would prove very useful in judging the success of your public education campaign. If you have a university nearby, they may have a class willing to take on a public poll as their project. More and more college programs are looking to public service as class requirements, and can prove an invaluable resource as you implement and evaluate your plan.

Once you've collected all the data and information, you need to summarize, analyze, and organize the information. Your designated point



adjustments and finetuning throughout implementation.

person should then hold a meeting for the team to look at the information.

Adjust the Watershed Management Plan

The best of watershed management plans will need adjustments and finetuning throughout implementation. If you have identified problems with the original action plans, they will need to be adjusted accordingly. If you have identified problems with personnel, consider sharing or shifting responsibility for the action to another agency or individual. If your timeline is not working as planned, you will need to adjust it accordingly. When you find that something isn't working, carefully examine why it isn't working; you don't want to shift a problem from one group to another without solving problems.

In addition, the committee you appointed earlier to identify gaps in the action plans should have their work completed within six months. Your planning team will need to meet once again to approve the action plans and add them to the watershed plan accordingly.

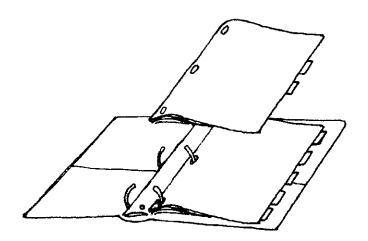
The ultimate goal of the evaluation process is to improve the plan for ongoing implementation. In Chapter 4 we said that if you wait until a

watershed management plan is perfect, you will never complete or implement it, and your team will lose momentum and credibility.

Perfection in an initial watershed management plan is impossible.

Through an ongoing evaluation process, however, you will have the opportunity to perfect your plan as you go. The information derived from the evaluation may also be used to secure or justify funding and technical assistance.

In addition, if you succeeded throughout the planning process in building a strong base of stakeholders to develop and implement the plan, the evaluation process is an opportunity for them to stay involved in protecting and caring for their water resource.





Prologue to Chapter 6

by James P. McNahon Mackinaw River Project Director, The Nature Conservancy of Illinois

hen I first arrived in the community to manage the Mackinaw River Project, I came in as an outsider, with the mission of wanting to protect a river in a watershed where all of the land was in private ownership. The idea was a strange one to the people who live here and they viewed it with suspicion and skepticism. The Mackinaw had been targeted for protection before, as a candidate for federal status as a Wild and Scenic River. Local people also based their skepticism on previous experiences with government and environmental groups, in which they felt certain of one thing: that once government gained a foothold in the river or in mandating land practices within the watershed, they would gradually change the rules, slowly diminishing the rights of the people who live and work here.

At the very beginning of the project, I frankly did not know what to do to accomplish either the mission of The Nature Conservancy or of the Illinois Environmental Protection Agency. Illinois EPA wanted to demonstrate a voluntary approach to the reduction of nonpoint source pollution through the involvement of local people in the development of a watershed management plan. The Conservancy's mission was to protect the fish and mussel populations in this high quality river. The landowners who had selected themselves to work with us, in response to nominations by local SWCD boards and a series of round table discussions with the Conservancy, were bent on controlling any program we implemented. When we first met, they wanted to know what I intended to do.

That was a difficult point in the project and I write about it here because I want you to get the point. Since I had no idea how to engage these people, I decided not to do anything. I told them we should just begin to meet together and try to figure it out. This turned out to be the best decision I ever made.

For months we just met and talked about the river. We toured the watershed together, people from the lower river seeing its headwaters for the very first time and vice versa. We listened to a number of scientists describe to us how the river had changed over the course of its history, both geologically and since the arrival of our predecessors, those industrious pioneers who had forever changed the face of the landscape. It became clear to

This handbook is about engaging people in a sincere process of learning about how a river works,



me that much of this was new information to our landowner team. From their perspective, the river appeared as clean and as healthy as it had ever been. Their personal experiences told them that the river did not need further improvement.

One local issue did emerge during our discussions, the issue of flooding. It turns out that farmers had experienced a gradual increase in the degree of flooding. Those in the lower river had built levees to keep the river out and those levees had to be increased in height over subsequent years as the river levels continued to rise during storm events. Our scientists looked at the data from United States Geologic Survey (USGS) stream gages and confirmed an increase of more than 40 percent in the maximum flood for a given rainfall over the last 4 decades. The prior two decades had shown a 20 percent increase. More water was entering the river immediately after the storm due to both extensive drainage of agricultural land and the growth of impervious surfaces in

Illinois EPA's interest in this project did not include the issue of flooding directly. Their goal is to reduce nonpoint source pollution. But the two issues are inextricably linked and provided the key to developing local interest. I am not suggesting that you use flooding to gain local ownership of a project you are considering. On the contrary, I am suggesting is that you listen, and listen closely, to the people who appear to be the most vehement opponents of your project idea. The key to implementing the project lies in their words.

The farmers and townspeople who live and work here in the Mackinaw basin are good people. The majority see themselves as stewards of the land and intend to pass their land on to future generations of their families. They have every intention of improving their land over the course of their lifetime and giving it to their children in better condition than they received it from their predecessors. But the river itself is viewed largely as a ditch, a convenient conveyor of water off of all of the land in the watershed. It had value as a place to fish and to hunt in the timber along its floodplains and bluffs, but the aquatic system itself was not given much consideration. The lesson we learned was that our only hope of achieving long-term protection was to trust in the goodness of the people and to collaborate closely with them in establishing the objectives of the project.

This handbook is about engaging people in a sincere process of learning about how a river works, what it is responding to, and how to intervene in a thoughtful way to manage the human impacts on the riverine system.

Through this process I came to view the issue of property rights differently as well. You will often hear property rights cited as a concern of local people in response to encroaching government interest in achieving some objective. You will see property rights mentioned in all of the Mackinaw literature. This was at the insistence of our landowner committee. The issue of property rights is a valid and honest concern. People genuinely don't want more restrictions on their ability to

what it is responding to, and how to intervene in a thoughtful way ...

manage their own property, nor do they want to lose the rights that they currently hold. For instance, the Mackinaw River is privately owned by riparian landowners. It is illegal for the public to canoe or fish the river without first gaining the permission of the landowners on whose property they intend to trespass. Yet a number of interest groups are attempting to change this right in order to gain a public right to access the river for recreation purposes. This is a legitimate cause as well but it threatens the loss of actual rights which riparian landowners currently hold. This only increases their

suspicion about other efforts to protect the river such as decreasing nonpoint source pollution levels.

If those of us who wish to protect what is left of our seriously degraded natural systems want to be

successful we must learn to respect the property rights of those people who own the land and water we hope to protect. Their leadership and stewardship is essential to the success of the project. We must learn to listen to the objections and concerns of local landowners and agree to respect those concerns.

On the other hand, local landowners will lose too, if they just dig in their heels and refuse to participate. Times do change and as we learn more about the impact of our lifestyles on the health of ecosystems we must modify our habits to manage those impacts. It is the responsibility of our state and federal agencies to restore balance and

attain a certain level of health in our land and water. If landowners refuse to be flexible they may as well be endorsing mandated regulatory solutions. The public also has a right, a right to impose minimum standards in order to maintain a healthy planet.

On the Mackinaw, we don't focus on these issues very much any longer. Once we learned that the landowners were serious about protecting their property rights, we agreed to respect them as well. And as landowners learned that we were serious about protecting the river, they agreed to collaborate.

...those people who

own the land...

their leadership and

stewardship are

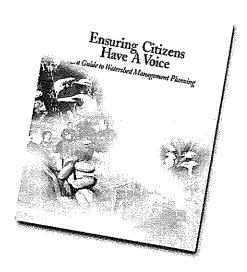
essential to the

success of the project.

It was interesting what happened next. As we sat down at the table to craft our plan to protect this river, we found suddenly that we had opened ourselves up to a powerful experience

and opportunity. We began to engage in the experience of community. If you want some guidance on community process I strongly urge you to read Community and the Politics of Place by Daniel Kemmis, the mayor of Missoula, Montana. He describes it powerfully.

This handbook that we have created describes the process we have employed to develop a watershed management plan. If you follow the process, you too can develop such a plan. But the deeper process we engaged in on the Mackinaw was the process of community. We listened to scientists tell us what was wrong with the river, we learned about the natural



You must understand the problems in order to figure out the solutions.

functions of the prairies, forests, and wetlands that have been lost over the years, we initially held fast to our individual positions as stakeholders, but we had agreed to be open, we agreed to 'fix' the river, and through honest and open dialogue we established far reaching action plans which will affect everyone who lives and works here in the watershed.

Community-based conservation, or voluntary action, will be slow, but it will be powerful and lasting. This approach to conservation will be successful because it builds ownership of the outcomes into the reality and vision of the people who live in any particular place. If local people become convinced of the value of an objective they can and will put it into effect on the ground.

Back when I first started working on the Mackinaw I had the fortunate opportunity to attend a Conservancy workshop at which Greg Lowe, a person with some twenty years of experience working in communitybased conservation, offered these ten bits of advice:

- 1. Always live in the place where you are trying to work.
- You need to understand the problems in order to figure out the solutions.
- Listen, Listen, Listen. You must know what the community is thinking.
- 4. Develop local leadership. It is enduring.
- 5. Be inclusive include both friends and adversaries.

- Help the community achieve its own goals.
- Keep your eye on results. Small successes will lead to larger ones.
- 8. Have patience and tolerance for ambiguity.
- 9. Get good help where you need it scientists, facilitators, pollsters, etc.
- 10. 'I never whistle for my bird dog, until he's heading my way.' In other words, don't start until the time is right and don't ask people to do something different until they are ready to do so.

It was Greg's advice that provided me comfort in letting go of having some preconceived notion of what the Conservancy needed to achieve in order to be 'successful'. In so doing, we became free to achieve even more than what we hoped for. In the long run, as long as we remain persistent and honest, I am confident now that we can protect the Mackinaw River, effectively reduce nonpoint source pollution, and be remembered by future generations as the group of people who came together and stopped the further degradation of their river - before it was too late.

I hope that you find the handbook helpful and wish you the best in your own endeavors.

Chapter 6

Mackinaw River Project as Case History

"Never doubt that a small group of concerned citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

never forget," says Mackinaw River Project Director Jim McMahon of The Nature Conservancy, "my first meeting with the Mackinaw landowners. I was new to the job, and I thought they would be welcoming – I thought they were happy we had this wonderful idea and wanted to give them a voice in the watershed planning process. Instead, they sat around the table with suspicious, angry faces, and stared at me. Then they let me have it. They didn't trust us, and they thought we were out to buy up land and take it out of agriculture, and bring about more regulation. I went home that night, and thought, "now what am I going to do?"

Mackinaw River Watershed Map

WOODFORD together with the Conservant Watershed Management Plant LIVINGSTON

FORD

TAZEWELL

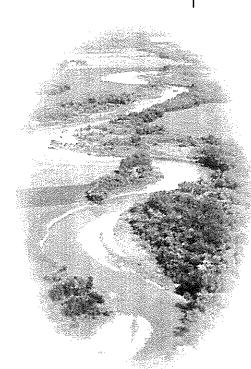
MCLEAN

The story about how those same suspicious landowners eventually came together with the Conservancy and other partners to write a comprehensive Watershed Management Plan is a story about perseverance, respect, and

simple neighborly values. It is that story we would like to share with you in this sixth and final chapter.

Since we hope others will learn from the Mackinaw team's successes – and their mistakes – we will describe how the process outlined in the first five chapters of this handbook worked for us. However, as the preceding anecdote illustrates, the story of

... the Mackinaw River's high water quality and relatively healthy fish and mussel population



the Mackinaw River Project is much more than a tale of planning processes, strategies, and water resources. It is a story about people people who despite their widely varying backgrounds, opinions and motivations, came together to take responsibility for their river. They dedicated hundreds of hours to the project, occasionally took time off work for two-day-long planning meetings, came to evening meetings weary from long days harvesting their fields, and made many other sacrifices for the project. Ultimately, they overcame personal differences to write a voluntary Watershed Management Plan. It is the Mackinaw River Project volunteers who deserve credit for the plan.

Targeting a Priceless Prairie River

From the beginning, the Mackinaw River Project was on the vanguard of current Nature Conservancy projects. The Conservancy is an international, nonprofit organization dedicated to saving rare and endangered species by protecting their natural habitat. Traditionally, the Conservancy identified critical habitat, and using a straightforward business-like approach, purchased it from willing sellers when possible. However, in recent years the Conservancy has moved toward an ecosystem-based approach to conservation. As a result, it has begun forming partnerships with local communities, landowners, and other organizations to achieve

regional conservation goals necessary to conserve larger landscapes and ecological processes, such as floods, which sustain the plant and animal species native to them. Although community-building projects such as the Mackinaw River project were relatively new for the Conservancy, it had always been the Conservancy's belief that human beings and nature could coexist in harmony. The Mackinaw River Project was – and continues to be – a manifestation of this philosophy.

The Nature Conservancy first became interested in the Mackinaw River in 1991, when it initiated conversations with scientists at the Illinois Natural History Survey, Illinois State University, and the Illinois Department of Natural Resources to determine state river conservation priorities. In these meetings, as well as in internal meetings, the Mackinaw River's high water quality and relatively healthy fish and mussel population highlighted its status as one of Illinois' finest remaining prairie streams. In addition, the Mackinaw played an important role in the overall health of the Illinois River ecosystem. From 1991 to 1993, the Conservancy worked with a number of agencies, including Illinois EPA, IDNR, the Nature Preserves Commission, and the Illinois Natural History Survey to discuss strategies for gaining scientific consensus in setting priorities for protecting and restoring the Mackinaw River.

highlighted its status as one of Illinois' finest remaining prairie streams.

Since the huge majority of the Mackinaw River flows through privately-owned land, the group realized that landowner support would be vital in protecting the river. In addition, they knew that 94 percent of the watershed's land is agricultural in nature, and the challenges, strategies, and solutions would be radically different from those in more urban areas. By protecting and restoring the Mackinaw, the Conservancy and its agency partners realized that working together, they had the opportunity to create a case study to help those in rural communities with similar management challenges.

As the Conservancy worked with the Illinois EPA in particular, the two organizations recognized that they had a mutual interest in developing a process that would improve water quality and protect aquatic habitat in a rural watershed without creating additional regulation. Thus a partnership was born between The Nature Conservancy and the Illinois EPA that formed the foundation for the Mackinaw River Planning project. The Conservancy applied to the Illinois EPA for funding and received a \$501,000 grant to develop a project handbook describing the steps necessary to develop a Watershed Management Plan, field test different activities to engage watershed stakeholders, apply demonstrative best management practices, develop educational materials, and produce GIS maps. These funds provided staff for the project, including a project director, a community outreach

coordinator, and a planning coordinator.

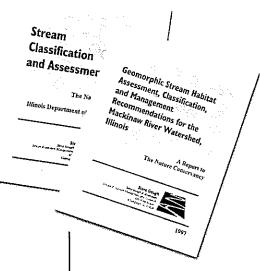
In addition, the Conservancy secured three grants to support scientific research: \$100,000 from the United States EPA, \$70,000 from Atlantic States Legal Fund, and \$20,000 from IDNR. With the help of this funding, the Conservancy hired an aquatic ecologist to develop a site conservation plan, which would involve identifying rare elements in the river, analyze the stresses affecting these elements, and develop strategies to alleviate the stresses. The Conservancy also hired a consultant specializing in stream ecosystem management and research to conduct extensive surveys of the river and its tributaries. The consultant recorded information on topography, hydrology, water quality, channel dimensions, bed and bank materials, riparian and floodplain vegetation, in-channel features such as bars and riffles, and tabulated structural management features, such as bridges ditching, levees, and soil conservation and bank protection measures. Using this information, the science team developed a river classification system to provide holistic strategic and technical guidelines for ecological restoration and protection of the Mackinaw. Along with conducting their own research, Conservancy staff relied heavily on existing information from other sources. (See "Chapter 2: Learn About Your Watershed" for a description of available watershed data sources. More details on what the

team learned about the Mackinaw is

WORDS TO KNOW

Geographic Information System (GIS):

A computer system that assembles, stores, manipulates, and displays geographically referenced information.



... the Conservancy and the Illinois EPA recognized a mutual interest in developing a process

provided later in this chapter.) Other Conservancy science staff provided support and technical assistance to the Mackinaw Team as necessary.

Building the Watershed Planning Team

While the science team worked to learn about the Mackinaw,
Conservancy staff focused on forming a community-based grassroots organization to guide the project and write the Watershed Management
Plan. Both the Illinois EPA and the
Conservancy envisioned that the plan would be supported and carried out by the watershed residents themselves, with financial and technical assistance from the agencies. It was a revolutionary concept, and both organizations knew that answers would not always be easy. And indeed, they weren't.

Many of the initial efforts to recruit landowners from the watershed were met with suspicion and hostility. Throughout 1993 and 1994, the Conservancy worked closely with the Resource Conservation and Development (RC&D) and the local Soil and Water Conservation Districts (SWCD's) to set up informational meetings in the three largest counties in the watershed: Tazewell, McLean, and Woodford. The goal of these early meetings was to identify landowners who might be interested in working with the project. The Conservancy and others found much interest in the project among landowners. Those who live along the lower river were

enthusiastic because they agreed a watershed approach was critical to solving their problems - especially flooding. Farmers along the upper river recognized the value of their resource and wanted assistance in protecting it as well as controlling growing public use. Both groups appreciated the project organizers' interest in drawing upon landowners to lead the project and solve these problems using their many years of experience living along the river. There was also skepticism and concern about the Conservancy and other agencies, especially among the landowners who lived along the middle portion of the Mackinaw. Some landowners attended early meetings merely out of suspicion while others were quite vocal in suggesting that these "do-gooders" should leave.

One landowner group in particular, the Mackinaw River Valley Improvement Association (MVIA), played a prominent role in the early meetings. The group had formed originally to address concerns about flooding and other problems in the lower Mackinaw River, MVIA members had seen many previous efforts to manage the river, such as channelization and using "rip rap" or concrete structures to reinforce river banks, fail miserably. These previous efforts had failed because they worked against instead of with the river's natural processes, and many of the MVIA landowners recognized a need for more innovative solutions. While they expressed a cautious interest in



that would improve water quality and protect aquatic habitat ...

participating in the project, they were uneasy and concerned about the Conservancy's motives and its ties to the Illinois EPA. An overriding issue for these and other landowners was property rights, and they were intensely concerned about any effort that might infringe on these rights and affect their economic well-being.

Because of the atmosphere of suspicion, the Conservancy waited to initiate the formal planning process while they focused on building a more trusting relationship with the MVIA and other landowners from within the

MVIA members had

seen many previous

efforts to manage the

river ... fail miserably.

watershed. Conservancy representatives continued to meet with them, both one-on-one and in groups, and listen to their concerns. Despite their strong reservations,

the MVIA members saw an opportunity to help resolve problems in their watershed, and agreed to help the Conservancy expand the group of participating landowners.

The Conservancy sought to bring these landowners together with agency partners to facilitate communication, since the agencies were also legitimate stakeholders in the Mackinaw River watershed. Landowners in the area were so suspicious of some agencies, however, that getting them around a table to have constructive conversation seemed impossible at times. Fortunately, some of the agencies had working relationships with local farmers. The Farm Bureau in particular was key to

early efforts to identify and build relationships within the farming community.

Though some of the early stakeholder meetings were difficult, important accomplishments were made and relationships developed that were key to the project's eventual success. First, the Conservancy listened to the landowners. In return, the landowners realized these organizations were genuinely interested in hearing their concerns. Second, the Conservancy and Illinois EPA were able to demonstrate their willingness to

develop a foundation of trust that would result in a voluntary Watershed Management Plan. Eventually, the landowners were reassured that the

Conservancy and Illinois EPA had no "hidden agenda." Third, through intensive outreach efforts, the Conservancy was able to identify key landowners who would be candidates for a Mackinaw River Planning Team.

Still, there were major hurdles to clear before a functioning team could be formed. Although the Conservancy, the agency partners, and the landowners had made significant progress in building lines of communication, they were not ready to form a cohesive planning structure. To help them work through the process of deciding how - and if they were to organize themselves, the Conservancy enlisted the help of a professional facilitator to lead an

chapter six

At long last, the groups were learning to trust each other, and were communicating openly.



Michael Reuter - Director of Conservation Programs, The Nature Conservancy of Illinois

It is impossible to express in a few chapters what we experienced on the Mackinaw River during the past five years. This project was a risk for the Conservancy, and it was a risk for the community leaders and partners, including the Illinois Environmental Protection Agency, who joined with us. Five years ago there were few models of deep community-based conservation in riverine systems to draw upon. We all felt as though we stood on the edge of a cliff, unsure whether the tide was in or out.

But our desire to jump was bolstered by a conviction that if people were entrusted, if they were given real authority, and if they were provided with good information, they would make good decisions. At the time we had little more than an idea to bring to the table. So we worked to establish trust while putting in place the science needed to inform our work.

We learned much from this experience, and I would suggest there are several factors integral to success in community-based watershed management planning. First, and most importantly, you must have good leadership. Without landowners like Sally Breese and Kevin Coulter people willing to risk reputations in order to make good things happen - we could not have moved forward. Likewise, without people like Kim St. John at Prairie Rivers Resource Conservation and Development (RC&D), Tom Clements at Tazewell County SWCD/ NRCS, Doug Godke at Tazewell County Farm Bureau, Jim Rutherford and others at SWCD/NRCS, and numerous river ecologists, we would have washed up on the beach early on. In the beginning spend all your energy building a leadership team; the rest will follow.

Second, you must follow a strategic approach based on 1) a solid understanding of the ecological system

stresses on the system and the human activities which cause these stresses; 2) an assessment of the local community and economy; and 3) sound strategies to abate critical threats to the ecosystem. Think hard about this as you begin. You won't be able to solve all the problems — you need to solve the most critical ones. Rely on your leadership team to help you. Think deeply about the partnerships and alliances you will need to build to implement your strategies, and engage these folks early.

Third, you will need adequate funding to sustain the initiative and implement your strategies. It's usually best not to find money too early as it will distort the process. But don't wait too long either. As your plans and strategies develop you will have limited time to begin implementing them to maintain the partner's interest.

Finally, establish connections to other projects and learn as much as you can from them. But then improvise. Adapt to your local situation and experiences. Let your intuition guide your action steps. I knew from my background of growing up in a small, German farm community in western lowa that an "environmental" organization coming to a rural community in Illinois would stir things up. We were prepared to adapt our approach and change our thinking — and we did that a lot as we learned more about the Mackinaw River watershed. We all constantly challenged our assumptions, and we struggled together to meet the many challenges that we encountered along the way. We made a difference because of our persistence — and I will be forever thankful that we did.

In the end, remember that there is nothing as powerful as an idea whose time has come. Once people really begin to think critically about how they want to live, and how they want to leave this world, powerful changes are just around the corner.

intensive, two-day pre-planning meeting with landowners and several key agencies.

During the meeting, the facilitator divided participants into several small discussion groups, and asked each group to outline their visions of the best and worst possible outcomes to the planning process. Afterwards, representatives from The Nature Conservancy, Illinois EPA, NRCS, the Illinois Farm Bureau, and IDNR made presentations to the group and responded to concerns expressed during the break-out sessions. The pre-planning meeting was a turning point in the process. At long last, the groups were learning to trust each other, and were communicating openly. The meeting provided a structured format that helped participants clarify and articulate their motivations, hopes, and fears about the river's future and the planning process. Finally, they were in a position to move ahead and create a more formal organizational structure.

The newly-formed Mackinaw River Executive Committee used the preplanning meeting to agree upon the organizational structure. After identifying the many diverse watershed interests that needed representation, the committee set up a method for expanding the Planning Team. The group also agreed upon a timeline for completing the Watershed Management Plan. The final structure included an Executive Committee, charged with guiding the overall planning process and serving as

They also learned to respect each other, and consider other viewpoints.

the nominating committee for the Planning Team; a Planning Team charged with developing the Watershed Management Plan; and Action Teams, who would be responsible for developing detailed action steps to successfully meet strategic plan objectives. In addition, representatives from the agencies agreed to serve on a technical advisory team.

A small group of landowners, all members of the MVIA, formed the Executive Committee. They decided that the Executive Committee should include five members from each of the three major counties in the watershed. The Conservancy's Mackinaw River Project Director was also given a seat on the Executive Committee and Planning Team.

Great care was taken to ensure geographic diversity on the team. This was important because problems and stresses in the Mackinaw's upper reaches were quite different from the problems downstream. People downstream struggled with flooding, and at least in part blamed people upstream for land use practices that allowed too much water to flow into the river too quickly. Meanwhile, people upstream felt that those who settled downstream along the river were taking their chances with nature. As the education process progressed, both sides learned that the river's processes were much more complicated than that. They also learned to respect each other, and consider each others' viewpoints.

Through the consensus process, they realized that the only way they could get what they wanted was to listen to all viewpoints. Eventually, they realized that the group actually agreed on many of the things they had thought would be major obstacles.

The original Executive Committee was made up almost exclusively of farmers, (with the exception of The Nature Conservancy); there was no representation on the executive council from municipalities or organizations. Since 94 percent of the Mackinaw Watershed is in agricultural usage, this seemed to make sense. However, as the committee learned more about water quality and municipalities were identified as significant sources of pollution, the lack of municipal representation became more of a glaring gap. Without significant representation on the Planning Team, getting municipalities to buy in to the plan later would be more difficult.

When it came time to expand the Planning Team, the core group of landowners (those who had participated in the pre-planning process and now served on the Executive Committee), helped recruit other landowners from within the watershed. This confirmed the Conservancy's belief that once it identified a core group of volunteers in the watershed, they would be the best recruiters for the project. The Conservancy and the Executive Committee also worked to recruit community volunteers by sending

Watershed Map Showing Geographic Diversity

Many farmers along the Mackinaw River had farmed the same land for generations,

Planning Team nomination forms to various groups in the watershed, including the Farm Bureau, county boards, Soil and Water Conservation Districts, municipalities within the watershed, and a major metropolitan area located just outside the watershed that relied upon the Mackinaw for drinking water. In addition, they used community newspapers and posted notices asking for citizens interested in serving on the organization to contact the Conservancy. Despite these efforts, they had trouble recruiting volunteers from the municipalities with which they were most concerned. They did succeed in recruiting a few municipal residents, however. To ensure a diversity of interests on the team, they developed a matrix to use while approving Planning Team members.

Although it was a long and sometimes tedious process, the energy spent identifying and recruiting a diverse group of landowners was well worth the effort. Several of the Executive Committee members made no secret of their suspicion and initial dislike of The Nature Conservancy and the Illinois EPA. Their initial involvement, in fact, was based on suspicion. In their words, they "wanted to keep track of what you're up to." But these remarkable people, who had initially attended meetings out of suspicion or hostility, eventually became some of the team's most dedicated volunteers. Their commitment to the project was based on one important factor: they appreciated the fact that they truly

had a voice, and that the Conservancy and the Illinois EPA were listening. On their part, The Nature Conservancy project staff did not mind having "doubters" on the team; on the contrary, the staff welcomed and encouraged their involvement. Since involving local landowners in a watershed management project that would protect water quality and biodiversity was one of the biggest hurdles, having the "doubters" on the team was the best way to clear that hurdle. As they became involved in the process, were educated about the river and its processes, and were given a voice in the Watershed Management Plan, they could help recruit other skeptical landowners. This strategy worked extremely well. Although it made for some tense meetings in the early days, if it were not for the "doubters," the plan would never have truly reflected the needs of watershed citizens. Their support was critical to the development of a voluntary Watershed Management Plan. (It is important to note, however, that there is a difference between a doubter and an obstructionist. While we took care to include those with differing opinions, we did not want to include people who would be disrespectful of fellow team members. Our facilitator set firm ground rules and managed the process carefully to keep this from happening.)

Many of the farmers along the Mackinaw River had farmed the same land for generations, and they had much to teach us about the realities of

and they had much to teach us about the realities of agricultural life.

agricultural life. In return, we were able to share information about river and watershed processes to which that they had not previously had access. We were also able to facilitate meetings with partners who may have not otherwise come together. The Conservancy's job was not to run the show, but to engage watershed residents, communities, and federal, state, and local agencies, and provide a catalyst for the watershed planning process.

It was important at all stages of the planning process to put everyone's

... the whole point:

ensuring that

stakeholders had

a voice.

interests – including the Conservancy's – on the table at the same level with everyone else's. Since the Conservancy's mission is saving and preserving rare and endangered species by

protecting critical habitat, the
Conservancy was primarily interested
in protecting and restoring a full array
of aquatic and riparian life, including
some of the state's rarest aquatic
species. The Illinois EPA was
primarily interested in water quality
protection through watershed
planning and management and the
implementation of best management
practices. The landowners had many
different concerns, including water
quality and flooding.

Property rights continued to be a major concern for landowners on the team, and was a recurrent theme throughout the process; indeed, during the early meetings, it was the overriding issue and dominated many

discussions. Along with their concerns about regulatory infringement on their rights, landowners were concerned that attention to the Mackinaw would bring more tourists to the river, and consequently more trespassers. They felt strongly that water flowing through their land constituted private property, and did not want the river opened to the public. However, as the team learned more about the river and its processes, property rights eventually stopped being the single overriding issue. While it remained a major concern, property rights eventually became one of many issues

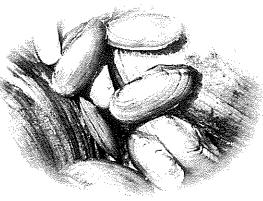
discussed by the landowners. This was a victory; it meant that educational efforts had been successful.

Without a doubt, developing a cohesive Watershed Management Plan using stakeholders with widely divergent interests including everything from defending property rights to protecting mussel populations - would be challenging, to say the least. However, the diversity of the team was an indication of success. All of these various interests were representative of the concerns of most watershed stakeholders. This, after all, was the whole point: ensuring that stakeholders had a voice. If a Watershed Management Plan couldn't meet with approval from the Planning Team, it would never be embraced by the public at large. Once the Executive Committee had recruited and approved 30 Planning Team members, the facilitator

WORDS TO KNOW

Index of Biological Integrity (IBI):

A water quality assessment tool, based upon fish and macro-invertebrate inventories, which is used by agencies such as the Illinois Environmental Protection Agency.



Historical perspective was particularly important as the team tried to determine how

WORDS TO KNOW

Geomorphology:

The study of the characteristics, origin, and development of land forms.



Mackinaw River Project Mission:

"We intend to preserve and enhance the natural resources of the Mackinaw River watershed through education, good management practices and voluntary cooperation while respecting property rights." returned to lead an intensive two-day meeting to develop a strategic plan. Once again, having a facilitator proved critical to success; with such widely diverging interests and opinions, the value of a good facilitator became immeasurable.

At the time the Planning Team was writing the strategic plan (mission statement and objectives), scientists from the Conservancy, IDNR, Illinois EPA, and the Illinois State Water Survey had already been hard at work studying the watershed and working to educate the team about the different problems facing the Mackinaw. Using that knowledge, the team was able to formulate good general objectives, including the following: a percentage reduction in water volume, velocity and frequency of extreme flood events; observable, measurable reduction in bank erosion and an increase in amount of stream bank protection/vegetation; an increase in the average Index of Biological Integrity; reduced sediment loads; perceived reduction in soil erosion; and reduction of untreated sewage.

The Mackinaw team's mission statement was: "We intend to preserve and enhance the natural resources of the Mackinaw River watershed through education, good management practices and voluntary cooperation while respecting property rights."

There was a great deal of debate — managed skillfully by the facilitator — before the team reached a final compromise on the strategic plan,

which outlined the Mackinaw project's goals, objectives, mission, and statement of beliefs. It took a full two days of hard work for the team to write the strategic plan. However, the fact that people with such differing viewpoints could reach consensus was a considerable victory and boded well for the challenges ahead.

Learning About the Mackinaw

In the case of the Mackinaw River Project, studying the watershed took place simultaneously with building and engaging the watershed team. As mentioned earlier, the Conservancy hired several scientists to study the current state of the river, including geology and geomorphology, historic and current land use, physical and chemical water quality, channel stability and sediment movement, and aquatic biota and habitat. In addition to the Conservancy's field studies, the Mackinaw River team relied greatly on work that had already been done by other agencies, including the Illinois EPA, NRCS, IDNR, and Illinois State History Survey. (See "Chapter 2: Learn About Your Watershed" for information on where to find existing data.)

The team's scientists also relied on research into early settlers' accounts of the Mackinaw River and its watershed to determine its current condition. These early reports formed the basis for their ability to report serious degradation of the river since pre-

channelization and bank erosion had affected the river over the years.

settlement times. At one point, a Planning Team member turned up an incredible stash of old pictures of the Mackinaw dating from the past century that had been boxed up and forgotten in the Tazewell County Clerk's Office. The photos not only provided a wonderful glimpse into the early settler's lives, but they provided some idea of how the Mackinaw River once looked. Historical perspective was particularly important as the team tried to determine how channelization and bank erosion had affected the river over the years.

By looking at changes in aquatic populations since the 1950s, the science team determined a great deal about water quality trends. (This is an example of how different water resource factors, including water quality and aquatic populations are interrely.)

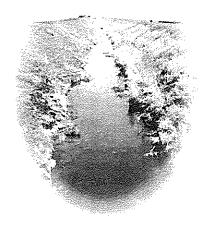
populations, are interrelated.) In general, Conservancy scientists estimated that loss of suitable habitat, combined with persistent turbidity (lack of clear water), had been a major cause of the loss of approximately 25 percent of fish and mussel species in the watershed.

Studies of USGS data at stations throughout the river and its tributaries indicated a serious change in quantity of water flowing through the Mackinaw River watershed in the past few decades. (The USGS had been collecting data on the Mackinaw as far back as 1921.) As previously

mentioned, some residents - especially along the upper reaches of the river had argued that flooding downstream was natural, and people who decided to live there must suffer their fate. Careful study of the river's history showed this to be only partially true. Since the 1920s, the amount of water entering the river immediately after a rain had increased by an astounding 60 percent. The data revealed that flooding along the Mackinaw and its tributaries may indeed be natural, but flooding to the extent it takes place today is not normal. This is in large part due to land use changes.

... with such widely diverging interests and opinions, the value of a good facilitator became immeasurable. At one time rivers like the Mackinaw meandered through prairie landscapes, rolling hills, and woodlands; today they flow through agricultural fields and small cities. As is the case with most

of Illinois' waterways, the farms and towns that dot the Mackinaw's banks use the river primarily as a pipeline to move water downstream. There are no longer prairie wetlands and plants to soak up and filter water flowing to the river; instead runoff flows quickly through farm tiles, pipes, and conduits, dramatically increasing the water flow in the river and resulting flooding incidents. Cut and eroded banks along portions of the Mackinaw and its tributaries provide stark reminders of high waters that roar through the river during periods of major rainfall, causing floods in the lower Mackinaw. The flooding



There are no longer prairie wetlands and plants to soak up



problems faced by downstream farmers along the Mackinaw are similar to those faced by others who farm along prairie streams throughout the state. The increased water not only wreaks havoc on the surrounding farms and communities, but soil from the deteriorating banks clouds the once clear river water, causing a significant decline in water quality.

Another important source of historical data that helped us understand these dramatic changes on the Mackinaw River was the Illinois State Water Survey. In 1961 the ISWS completed a comprehensive study on hydrologic budgets (stream flow, flooding, and drainage) for three small Illinois watersheds, including Panther Creek, a tributary of the Mackinaw. This information was extremely useful, since it enabled the team to compare detailed historical stream flow data with current stream flow data. This data indicated a two-foot drop in groundwater levels, most likely caused by field tiles, which would have a dramatic effect on base flow.

Throughout the educational process volunteers on the technical advisory committee helped locate and interpret data. As more information was gathered and synthesized, Executive Committee meetings and Planning Team meetings were held to educate team members and update them on the ongoing study results. The team found some scientific river process explanations more useful than others. They were impatient, for example, with lectures on hydrological models

and other theoretical discussions. They were more impressed and motivated by hard information in the form of facts and measurable data. This no-nonsense approach served them well later, as they worked to write action plans and develop an implementation schedule. This was a group of people unlikely to become tangled up in abstract, theoretical discussions – they were there to do a job, and wanted to stick to the subject at hand

Action Teams

Once they articulated their mission, objectives, and strategies in the strategic plan, the Planning Team members were ready to form Action Teams and recruit additional volunteers to serve on these teams. The Action Teams were created to directly address the strategies formulated by the Planning Team during the first two-day planning session. Using the same matrix developed for Planning Team recruitment, the Conservancy worked with the Executive Committee to organize the teams. They put together six teams, and each one was charged with developing a set of action plans to implement a specific strategic plan objective. The Action Teams included the following: Municipal Actions, Education, Agriculture Practices, Agency Coordination, Property Rights, and Biological Diversity. Each Action Team included one or two Planning Team members to facilitate communication between the Action

and filter water flowing to the river ...

Teams and the Planning Team. This proved very helpful throughout the Action Team planning process.

In retrospect, Conservancy staff could have spent more time interviewing potential Action Team leaders. Most volunteers selected as Action Team leaders were well known to the Conservancy or Planning Team members, understood the project's mission, and worked out well. Several of the leaders we selected, however, were unknown quantities. While they looked good on paper, once they were into the action plan writing process, it quickly became clear that they were not supportive of and did not understand the watershed planning process. This led to an awkward situation in which the Executive Committee asked one of the leaders to resign. The remaining members of the leaderless Action Team were forced to pick up the slack, but the action plans suffered. Because of the low morale on that team, many of the team members simply stopped coming to meetings.

Another possible improvement would have been to facilitate more communication between Action Team leaders at the beginning of the process. The Action Team process we used was designed for a more close-knit group, such as corporate staff, and had never been tried with a watershed planning group. To effectively use the process with our loose-knit group, extra efforts at facilitating communication would have been beneficial. Some Action Teams,

thanks to strong leadership, worked efficiently from the very beginning. Others struggled more, and could have used more guidance as they set out to write their plans. Less experienced leaders felt somewhat isolated from the Planning Team and overwhelmed with the task ahead of them. Some volunteers found the task much more time-consuming than they had originally envisioned. In addition, confusing overlaps existed between the six Action Teams and the strategies they were addressing; had Action Team leaders been encouraged to communicate more efficiently, they could have helped each other, making for a less frustrating experience. More guidance and communication during the early part of the Action Team process would have saved the team's time and energy as they worked to find direction. Finally, prepared templates for action plans were provided, but they were very general and difficult to adapt to the task of writing Watershed Management Plan objectives. More specific templates would have been very helpful in keeping action plans and their goals, objectives, schedules, and resource needs outlined in a consistent manner.

The Planning Team met twice in the course of eight months to consider action plans. At the first meeting, the Action Teams presented roughed out potential action plan objectives for the Planning Team to rate. This step proved critical, since the Planning Team modified some objectives and rejected a few outright. This preapproval process helped Action Teams



More guidance and communication during the early part of the Action Team process



A Community's Young People Take Charge

Local schools have played - and will continue to play - a vital role in the Mackinaw River Project. The Mackinaw River Public Outreach Coordinator, Diane Rudin, (a former high school teacher), firmly believes that if a voluntary watershed management plan is to succeed, the watershed's young people must be

Experience has proven her point. The students at Roanoke-Benson

involved.

high school, who originally became acquainted with the river during a water-quality monitoring project organized by Diane, have been especially active in the project. Once they learned about the tremendous value of the river in their midst - as well as the threats to its health - they were not content to sit on the sidelines. Among other activities, they joined forces with the local Future Farmers of America (FFA) Chapter to organize a "Conservation Choices Conference" to introduce local farmers to grants available for erosion control projects.

Ironically, on the day of the conference flood waters invaded the building where the event was to be held. Undaunted, the students pulled on their hip boots, waded into the facility, and moved entire conference to higher ground. They took advantage of the flooding situation to discuss how greater conservation measures upstream could result in less flooding in "downstream" communities.



community spirit, and success in helping protect their watershed continue to be an inspiration to all involved with The Mackinaw River Project.

The students are now turning their attention to the Village of Roanoke in Woodford County, persuading the Village Council to write and adopt an erosion/stormwater control ordinance, and develop a long range comprehensive growth plan that accomodates increased stormwater runoff. "The voices of young people approaching members of thier own community to become educated about the need for conservation is a powerful tool in achieving long lasting change." - Diane Rudin, Mackinaw River Project Manager/Public Outreach Coordinator

avoid expending a great deal of time developing detailed action steps for plans that the Planning Team would reject at a later date. Once the Planning Team gave its feedback to the Action Teams, the Action Teams returned to work developing detailed plans. Six months later, the Action Teams presented the completed plans to the Planning Team. The Planning Team met for two days reviewing the plans and modifying as necessary.

At the meeting, a Conservancy staff member took careful notes of all decisions, and copies were later sent to the Planning Team for final verification and approval. All approved action plans were included in the final Watershed Management Plan. A technical writer was hired to write the plan itself, which included all of the information listed in the "Write the Watershed Management Plan" section of Chapter 5. Again, the writer sent the initial report to Planning Team members for review. The first version of the plan was completed in the spring of 1997. The Watershed Management Plan was then sent to a variety of organizations for review, and was scheduled for its first update in January of 1998.

Building Public Support

The Nature Conservancy staff and key volunteers from the Executive Committee began a public education effort very early in the process; in fact, public outreach projects were initiated before the Planning Team was

would have saved the team's time and energy ...

... the Mackinaw

River is a source of

local pride, and the

team wanted to

make residents

aware of the treasure

in their midst.

formally organized. Since the project's goal was to develop a voluntary Watershed Management Plan, the Conservancy and the Illinois EPA agreed that public education was critical to its success. With the help of Illinois EPA funding, the Conservancy hired a public outreach coordinator to manage this aspect of the project. The goals were to familiarize watershed residents with the Mackinaw River, recruit potential Planning Team and Action Team volunteers, and pave the way toward a favorable reception to the Watershed Management Plan.

The Conservancy used a variety of public relations tools to get the word out about the Mackinaw project. The outreach coordinator developed a series of slide shows and arranged a multitude of speaking engagements. Many

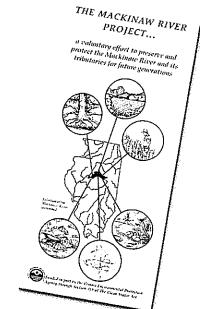
groups, such as local Rotary Clubs and Garden Clubs, are always looking for programs, and she found it was not difficult to secure speaking engagements. The Nature Conservancy's Mackinaw River Project soon became a popular program for many civic organizations. Along with the slide show, other education materials, including a brochure, newsletters, and informational packets, were developed and distributed. (In keeping with the partnership approach used in the planning phase, the Executive Committee reviewed all public

relations materials before distribution.) The staff also developed a coloring and activity book for children. The team was particularly concerned about the level of municipal involvement in the process, so they put special emphasis into targeting municipalities within the watershed through presentations to village and town councils and county boards.

Public outreach efforts focused on several important primary messages. First, as one of the state's finest remaining prairie streams, the

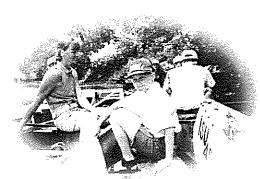
Mackinaw River is a source of local pride, and the team wanted to make residents aware of the treasure in their midst. However, residents also needed to know that it is a river under stress, and that action is needed to preserve and improve

water quality. Second, the Mackinaw River Planning Project provided an opportunity for citizen volunteers to take control of managing a local resource instead of relying on the regulatory process. Finally, since much of the audience came from rural communities where "neighborly" values still thrive, the outreach coordinator always emphasized that in many ways, the Mackinaw River Project was all about being good neighbors. The outreach coordinator, for example, found that many people in her audiences were surprised to learn that chemicals from their lawns



chapter six

... seeing the watershed and experiencing the river itself was more effective



could significantly affect the Mackinaw's water quality, and that stormwater runoff from their suburban neighborhoods could impact a farmer in a different county by increasing floodwaters, and this knowledge concerned them.

The team targeted VIPs and local media sources by organizing a series of canoe trips and tours of the watershed to introduce them to the river. Several landowners on the Executive Committee who lived along the river often went along on canoe trips. The combination of seeing the watershed and experiencing the river itself, and hearing from the landowners who cared so deeply about its fate, was more effective than any expensive media campaign could have been.

Demonstration Projects

The Illinois EPA and the Conservancy believed that funding demonstration projects would serve two important purposes: the projects would provide opportunities to demonstrate various best management practices, while at the same time enhancing public knowledge of the water resource and the Mackinaw River Planning project.

To implement other demonstration projects in the watershed, the Executive Committee advertised the need for BMPs and that funding was

available for demonstration projects and asked for applications. They then developed a series of criteria by which they could rank the applications. (For a general description of how they went about it, see "Consider Demonstration Projects" in Chapter 4.) The committee approved a wide variety of projects. Many of them were submitted by farmers interested in constructing water control structures on their property, which would help decrease water flow into the river during heavy rainfall, stabilize streambanks, and reduce the amount of sediment entering the river or its tributaries.

Implementation – Where Do We Go from Here?

As this book goes to press, the Mackinaw River Project is heading into the implementation phase, and faces many challenges. Chief among the current challenges is determining how to keep an intact organizational structure throughout implementation, evaluation, and future adaptations to the Watershed Management Plan. The Planning Team has appointed a task force, which includes volunteers from the Executive Committee and the Planning Team, to decide how members should organize a watershed council for the future, and whether or not they should form an independent, not-for-profit organization.

The task force will also address membership issues, including how to increase municipal participation in the







than any expensive media campaign could have been.

effort. As previously mentioned, despite recruitment efforts, the Planning Team includes only a few volunteers from watershed municipalities. This gap will become more of a problem as the team attempts to enlist municipalities' participation in implementing municipal action plans. Gaining support from these municipalities remains a major challenge for the Mackinaw River Planning effort. The Planning Team asked the task force to report back to the Executive Committee in six months with their findings.

Originally, the Executive Committee had anticipated that approval of the action plans would represent the Planning Team's last formal meeting. However, it became clear that the group should not disband until the team could agree on another organizational structure. In the meantime, since it reflects the general goals and objectives for the entire Mackinaw River Watershed, the Watershed Management Plan will serve as the Planning Team's guiding document. The Conservancy will continue to guide the process and provide staff support until a permanent watershed council with the ability and will to take over the Mackinaw River Project is in place.

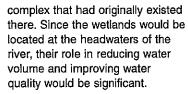
As part of implementation, Conservancy staff and volunteers are studying each subwatershed of the Mackinaw River System in depth, and writing detailed, individual subwatershed plans to address stresses



A Town Reclaims its Natural Heritage

An ideal opportunity for demonstrating best management practices presented itself when a family donated 50 acres of land to The Nature Conservancy in the town of Sibley, along the headwaters of the Mackinaw River.

The land featured 38 acres of intact burr oak groves with trees that are 300 - 400 hundred years old. On the remaining 12 acres of land, the Conservancy helped organize a volunteer project to restore the wetland



The restored wetland drains a watershed of approximately 100 acres of land that is primarily in agricultural production. The field

will be planted with a mixture of native wetland and wet prairie grasses and forbs that will filter and treat water entering the wetland from three major sources: overland surface water flow, field tile drainage, and a woodland

ravine. Before this wetland was restored, unfiltered water entered the Mackinaw River drainage immediately after a storm event carrying nonpoint source pollution such as sediment and excess nutrients.



The town of Sibley is a very historic-minded Central Illinois community that takes pride in its heritage. The community was aware of the historic woodlands on the land, and volunteers were not hard to come by. The Conservancy soon found that the people of Sibley had taken it on as a community project.

... you have to let go and trust the process even though, at times, you may feel lost.

within each one of them. These subwatershed plans will incorporate the goals, objectives, and action plans approved by the Planning Team. In Phase One of implementation, the team will identify three priority subwatersheds, and resources will be directed primarily to those areas. (The Mackinaw River watershed includes approximately 15 subwatersheds.) As the team works to prioritize subwatersheds, it will consider where threats are most critical and have watershed-wide impact. In addition, the team will consider the level of support already existing in the community, and how that support will affect each plan's success. Eventually all of the Mackinaw's 15 subwatersheds will have completed plans. Appendix A provides a summary of the Mackinaw River Watershed Management Plan, a list of the first three available subwatershed plans and a list of subwatershed plans to be developed in the future.

The Executive Committee and The Nature Conservancy are currently seeking funding for the implementation phase. In late 1996 the USDA Natural Resources Conservation Service designated the Mackinaw River as an Environmental Quality Incentive Program Priority Area, which will greatly help implementation efforts by providing funding for implementation projects. In 1998, the Illionois River Watershed was designated as a Conservation Reserve Enhancement Program (CREP) Priority Area. The first 100,000 acres allocated through

CREP will be targeted to lands adjacent to the middle of the Illinois River and the Peoria Lakes and six Illinois River tributary watersheds including the Mackinaw. The team secured further funding for implementation through IDNR's Conservation 2000 program. Working with NRCS and IDNR, the Mackinaw River Project also solicited and received applications for implementation projects from landowners throughout the watershed.

While the Watershed Management Plan's completion was a major victory, the obstacles ahead in the implementation phase remain considerable. The end rewards, however, are immeasurable. A voluntary Watershed Management Plan represents true citizen empowerment. Having the opportunity to provide a catalyst for that process was for the Conservancy, in the end, a tremendous honor. As Mackinaw Project Director Jim McMahon says, "you have to let go and trust the process, even though, at times, you may feel lost. If you give good people good information, they will make great decisions."

Bibliography

Books

Bolling, David M. How to save a River: A Handbook for Citizen Action. Washington, D.C.: Island Press.

Doppelt, Bob et al., Entering the Watershed: A New Approach to save America's River Ecosystems. Washington, D.C.: Island Press.

Ellis, Brian "Fox." Learning From the Land: Teaching Ecology through Stories and Activities. Englewood, Colorado: Teacher Ideas Press.

Kemmis, Daniel. Community and the Politics of Place. Normon: University of Oklahoma Press, 1990.

Terrene Institute. A Watershed Approach to Urban Runoff: Handbook for Decisionmakers. Alexandria, VA: Terrene Institute.

Public Documents

Illinois Environmental Protection Agency, Bureau of Water. *The Condition of Illinois Water Resources*, 1972-1994. Springfield, IL: IEPA/WPC/95-016.

Illinois Environmental Protection Agency, Bureau of Water. Illinois Water Quality Report, 1992 - 1993, Volume 1. Springfield, IL: IEPA/WPC/94-160.

Illinois Environmental Protection Agency, Bureau of Water. Mobilizing the Watershed Community: Linking Land, Water, and People. Springfield, IL: IEPA/WPC/95-023.

Illinois Environmental Protection Agency, Bureau of Water. Watershed Management Program. Springfield, IL: IEPA, Bureau of Water, Planning Section.

U.S. Department of the Interior, National Park Service; Association of State Wetland Managers; and Association of State Floodplain Managers. A Casebook in Managing Rivers for Multiple Uses.

U.S. Department of the Interior, National Park Service. *Riverwork Book*. Philadelphia, PA: U.S. Department of the Interior, National Park Service, Mid-Atlantic Regional Office, Division of Park and Resource Planning.

Glossary of Terms*

(*Unless specified otherwise, the following terms are being defined with reference to water and river watershed management even though many of them have wider application.)

Assessment Stations: Locations along a river or tributary where water quality is sampled for biological, chemical, and habitat data as well as stream flow.

Base Flow: The discharge of the stream or river during a period of average rainfall. Also a typical flow carried by a stream or river for a large percentage of a year.

Best Management Practices (BMPs): Methods that are used to prevent damage to natural resources; examples are filter strips, detention basins, woodland management, riparian corridor enhancement and terraces.

Biodiversity: A diversity, or variety, of natural plant, aquatic, and animal communities within the watershed.

Biofiltration: A plant's natural ability to filter out impurities in water.

Brainstorming: To engage in or organize shared problem solving.

Channelization: Deepening, widening and/or straightening a channel of the river or stream to increase its water carrying capacity. Loss of riparian vegetation usually occurs.

Conservation Credits: An approach where landowners would receive credit for adopting a specific Best Management Practice. These conservation credits could in turn be used by landowners for such things as a reduction in property taxes.

Conservation Plantings: Plantings of vegetation recommended for stabilization of highly erosive soils/areas.

Conservation Practices Program (CPP): Administered through the United States Department of Agriculture/Department of Natural Resources. Financial incentive program to install agricultural Best Management Practices.

Conservation Reserve Program (CRP): Administered through the United States Department of Agriculture/Department of Natural Resources. Financial incentive program to take highly erodible and environmentally sensitive land out of crop production and put it into permanent vegetative cover.

Conservation Targets: Quantifiable objectives a planning team can use to help prioritize action plans and later assess the success of their plan.

Conservation Tillage/Farming: The management of farm activities and structures to eliminate or reduce adverse environmental effects of pollutants and conserve soil, water, plant, and animal resources.

Cropping: The planting of agricultural products. For example: corn and soybeans are cropping.

Degradation: A noticeable decline in the health of an natural area such as a stream. For stream degradation this can be determined through water quality analysis and habitat assessment.

Dissolved Oxygen: The amount of gaseous oxygen dissolved in water.

Ecosystem: A "community" of animals, plants, and/or other natural objects and the environment within which they live or function and interact.

Environmental Quality Incentives Program (EQIP): Administered through the United States Department of Agriculture/Natural Resource Conservation Service. Financial incentive program that establishes conservation priority areas where significant water, soil, and related natural resource problems exist and provides assistance for the installation of agricultural Best Management Practices.

EPA 319: Refers to Section 319 of the federal Clean Water Act. Section 319 provides assistance to states to reduce the impact of nonpoint source pollution to local water quality.

Evapo-Transpiration: The diffusion of water vapor into the atmosphere from a vegetated surface. Part of the water cycle, refer to page 26.

Facilitator: Person or organization that guides a planning process.

Farm Service Agency (FSA): Local agricultural governmental agency, whose responsibility is to administer the United States Department of Agriculture Farm Bill.

Filter/Buffer Strip: A best management practice that utilizes an area of vegetation along a water body to reduce the delivery of soil and other pollutants to that water body.

Floodplain: A nearly flat area of land along the course of a stream that is naturally subject to flooding.

Forbs: A prairie flower.

Gage Sites: A selected cross-section of a stream channel where one or more variables are measured continuously or periodically to index discharge, stage, sediment concentration and yield and/or other parameters.

Geographic Information System (GIS): A computer system that assembles, stores, manipulates, and displays geographically referenced information.

Geomorphology: The study of the characteristics, origin, and development of land forms.

Global Positioning System (GPS): System used for site specific information, using satellites to pinpoint exact locations.

Groundwater: Water located below the earth's surface, usually in aquifers. Most wells tap groundwater. This water recharges slowly and is difficult to clean if it becomes contaminated.

Habitat: The region where a plant or animal naturally lives.

Heavy Metals: Natural metallic elements such as lead, copper, zinc, cadmium, and nickel which can accumulate in water and biological tissues. These elements are often found in elevated concentrations in industrial, municipal, and urban areas and can pose toxicity risks to living organisms.

Hydrologic Process/Cycle/Regime: This refers to the way water moves through the system. Surface waters evaporate and become clouds, which in turn release rain or snow. While nearly 90 % of water falling back to earth returns directly to the oceans, the remaining 10% falls over land. This water either soaks into the soil, evaporates from the surface, or transpires through plants (is lost through the openings in the plants' leaves).

Illinois Department of Natural Resources (IDNR): State agency that conserves, preserves and enhances that state's natural treasures, while meeting the outdoor recreation needs of Illinois' large and diverse population. Also manages game and fish populations, while protecting endangered plant and animal species.

Illinois Environmental Protection Agency (Illinois EPA): State agency that conducts field inspections and assists in identifying and helping solve actual or potential environmental problems in four major areas: air, land and water pollution, and supervision of public water supplies throughout the state of Illinois.

Illinois Natural History Survey (INHS): A division of the Illinois Department of Natural Resources which participates in many scientific research projects related to natural resources of Illinois and provides recommendations on important natural resource issues.

Illinois State Geological Survey (ISGS): A division of the Illinois Department of Natural Resources which conducts basic and applied research, compiles geologic maps, and gathers and manages the state's geological data in order to provide information to industry, government agencies and the public about the geology and mineral resources of the state.

Illinois State Water Survey (ISWS): A division of the Illinois Department of Natural Resources which evaluates the quantity, quality and use of ground, surface and atmospheric water resources in the state. Also serves as the state's center for scientific research and information on global climate change.

Index of Biological Integrity (IBI): A water quality assessment tool, based upon fish and macro-invertebrate inventories, which is used by agencies such as the Illinois Environmental Protection Agency.

Infiltration: The gradual downward flow of water from the soil surface into the subsoil.

Instream Habitat: Areas in a stream channel that provide aquatic organisms with adequate food and cover.

Nonpoint Source Pollution (NPS): This is the runoff of pollutants from various sources such as agricultural fields, construction sites, streets and parking lots into a stream, lake, river, or groundwater. The source is not easily identifiable.

Nutrient: An element or compound, such as nitrogen, phosphorous, or potassium, that is necessary for plant growth.

Natural Resources Conservation Service (NRCS): USDA federal agency that provides assistance to land managers, local units of government, and organized groups and communities. They work in partnership with the Soil and Water Conservation Districts on issues involving appropriate land use and sustainable development. These often include water quality, stormwater runoff, and erosion control.

Pathogen: An agent that causes a disease, especially a microorganism.

Percolation: The downward movement through the subsurface soil layers to groundwater.

pH levels: The level of acidity. An increase or decrease in acidity outside of the normal range creates a habitat unsuitable for the naturally occurring mussel and fish populations.

Point Source Pollution: The discharge from a single, readily identifiable source such as an industrial or sewage discharge pipe.

Protection: Maintaining existing natural systems within the watershed as opposed to (having to) restore these systems.

Restoration: Returning land to its natural state (e.g., recreating a wetland after the land has been drained or recreating a section of prairie)

Retention Basins: These serve as temporary "holding tanks" for large volumes of water that collect rather quickly, such as storm water after a heavy rain. The water is then slowly released into the ground or through a pipe to a stream or riverbed.

Riparian: Pertaining to anything connected with, or adjacent to, the banks of a stream or river.

River Corridor: The area that is included in defining the parameters of a given river. Sometimes this includes more than the river itself and the surrounding riverbanks, extending a quarter mile on each side of the river.

Rotational Grazing: Process where a pasture is divided up into a number of paddocks. Each paddock is intensively grazed for two to three days. After this intensive grazing, cattle would be removed to allow for vegetative regrowth for three to four weeks. This practice increases the productivity of the vegetative forage and allows more protection against soil and water erosion.

Savanna: Grassland region with scattered trees, grading into either open plain or woodland.

Sedimentation: A broad term that embodies the process of erosion, transportation, deposition, and the compaction of sediment.

Self-Cleaning: Natural processes that function to remove nutrients and sediment from a stream.

Stakeholder: Anyone with a stake in the watershed management plan. People who live, work, or recreate in the watershed. Local, state, and federal organizations and government can also be recognized as stakeholders.

Stewardship Ethic: Individuals who adopt an ethic of stewardship assume responsibility for helping to preserve and manage the long-term health and stability of an ecosystem, a species, etc. This attitude of respecting and valuing ecosystems, other species, and so on, is in marked contrast to the attitude that nature exists simply or primarily to be used for the benefit of human interests.

Stewardship: Adopting an attitude and/or practice of stewardship for e.g., a wetland, a savanna, a woods, a river is to manage this ecosystem in a way that promotes its long-term stability and well-being.

Stormwater Retention: Providing ways to slow down the discharge of stormwater into the river or its tributaries (cf. "detention basins").

Streambank Destabilization: The land along the river bank is eroding. This is usually caused by two interacting situations: vegetation along the top of the streambank has been removed (e.g., trees to prevent shading of cropland, trees and other vegetation so that farmers can plow as close to the streambank as possible) and there has been a significant increase in the speed and the volume of water moving down the river following a heavy rain.

Stressors: Factors which threaten the well-being or health and long-term viability of an ecosystem, a species, or a population.

Soil and Water Conservation District (SWCD): An local agency that provides leadership on conservation and wise use of the natural resources. They work in cooperation with the Natural Resources Conservation Service to create a balanced program that protects, restores and improves our "natural resources" and informs and educates the residents and cooperators about developing and applying a land ethic and sense of stewardship.

Symbiotic: A relationship between two things (e.g., organisms) or two kinds of things (e.g., land and a river) such that they interact to their mutual advantage.

The Nature Conservancy (TNC): A non-profit organization who uses a non-confrontational, collaborative, science-based approach to conservation and whose mission is to protect and restore plants, animals and natural communities that represent the diversity of life by protecting the habitats they need to survive.

Transpiration: Water being lost through openings in the leaves of plants. (see Evapo-transpiration)

Turbidity: The cloudy or muddy appearance of normally clear liquid caused by the suspension of particulate matter.

United States Department of Agriculture (USDA): A federal agency that provides natural resource conservation(technical and financial assistance), in partnership with local conservation districts and state conservation agencies. Also, provides a linkage to state and county conservation, research, education, and extension programs.

United States Geological Survey (USGS): A federal agency that provides reliable, impartial information to describe and understand the Earth. The information is used to: minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; enhance and protect the quality of life; and contribute to wise economic and physical development.

Water and Sediment Control Basins (WASCOBS): A Best Management Practice used to detain runoff and prevent erosion. An example would be a terrace or a dry dam.

Watershed: The surrounding area of land which drains into a water body by surface or subsurface flow.

Watershed Management Plan: A document originated by a community that identifies all natural resources, the problems impacting those resources, solutions for those problems, and opportunities within the watershed to improve the quality of life and the natural community, while meeting the environmental goals of the state and nation.

Wetlands: Areas which at least periodically have standing water, and which have soil types and plant growth typically found in saturated conditions.

Wetland Reserve Program (WRP): Administered through the United States Department of Agriculture/Natural Resource Conservation Service. Financial incentive program which provides assistance to wetland owners in the protection and restoration of wetlands.

Appendix A

Summary of the Mackinaw River Watershed Management Plan







Summary of the Mackinaw River Watershed Management Plan

Printed June 1998

		6.
		6.
		(.
		\bigcirc
		\bigcirc
		0
		0
-		
		0
		0
		$\overline{\cap}$
		<u></u>
		0
		0
		0
		\bigcirc
		0
		\tilde{c}
		$\overline{\bigcirc}$
		\bigcirc
		000000000000000000000000000000000000000
		\overline{a}
		0
		0
		000000000000000000000000000000000000000
		6

Acknowledgments

The Mackinaw River Watershed Management Plan is dedicated to the people of the Mackinaw River Watershed.

Special thanks to: the Mackinaw River Executive Committee; Planning Team Members; Action Team Members; Technical Advisory Committee Members; Mackinaw Valley Improvement Association; Natural Resources Conservation Service; Local Soil and Water Conservation Districts; Local Farm Bureaus; Illinois Department of Natural Resources; The Nature Preserves Commission, Prairie Rivers Resource Conservation and Development; The Nature Conservancy of Illinois; and Illinois Environmental Protection Agency.

This bound version of the plan does not include the subwatershed plans, watershed maps, or resources. To view a copy of the full plan with these components or for additional copies of this plan please contact the Illinois Environmental Protection Agency, Bureau of Water, Planning Section, P.O. Box 19276, Springfield, Illinois 62794-9276, Phone: (217) 782-3362, Fax: (217) 785-1225.

This publication was prepared using U.S. Environmental Protection Agency funding under Section 319 of the Clean Water Act distributed through the Illinois Environmental Protection Agency. The findings and recommendations contained herein are not necessarily those of the funding agencies.



Special Acknowledgments

We would like to express our gratitude to the following individuals who worked countless hours on one or more levels of the planning structure for this watershed management plan. These levels included: the executive committee, planning team, technical advisory team, and six action teams. We would also like to thank all the individuals, not listed below, who provided support to the Mackinaw River watershed planning effort.

Listed in Alphabetical Order

Adams, Mary Jo	Engelke, Russell	Kirchner, Kathe	Rudin, Diane
Baer, Robert	Ettinger, Bill	Kraft, Jackie	Rutherford, Jim
Baer, Tim	Fandel, Paul	Lindenbaum, John	Sampen, Ken
Ballowe, Ruth	Frazee, Bob	Lindenbaum, Tim	Sauder, Tyler
Barding, Dan	French, Andy	Lindholm, Gwen	Schlappi, Lorn
Bartle, Sheila	Garman, Kevin	Lindstrom, M.K. (Link)	Schleder, Mark
Bell, Dan	Giannoni, Terry	Mariana, Dana J.	Schreck, Tony
Birkenholz, Dale	Gilliland, Mark	Mathis, Bill	Schuler, John
Bolin, Mike	Glover, John	McFall, Don	Scifres, Dave
Braden, John	Golden, Philip	McMahon, Jim	Serangeli, Joe
Braun, David	Gowen, Julie	Meares, Jim	Sheets, Karen
Breese, Sally	Gulso, Alan	Meiner, Lonnie	Shields, Tom
Bremner, Janet	Hajic, Ed	Meiners, John	Simpson, Doug
Bremner, Rick	Hallowell, Margaret	Micheletti, Terry	Solecki, Mary Kay
Brown, Marvin	Hartzold, Sharon	Mick, Jim	St. John, Kim
Buswell, Mary	Henrichs, Chip	Middleton, Suzanne	Stewart, Dan
Burrier, Jr., George M.	Herrman, Carson	Miller, Katie	Stone, Claude (Bud)
Burton, Paul	Hingson, Paula Bohlen	Miller, Roger	Stroemer, Nick
Cable, Keith	Hoeft, Mary L.	Myers, Crystal	Sweckard, Joe
Carney, Doug	Hoeft, Mike	Netherton, Daryl	Uphoff, Kenneth
Clements, Tom	Hudson, Martin	Oertle, Larry	Waldo, Larry
Colburn, Thomas R.	Hudson, Teedra B.	Olmstead, Dr. Cynthia	Warner, Dick
Coulter, Kenneth	Huggins, Larry	Ondeck, Jim	Wendte, Leon
Coulter, Kevin	Jamison, Jolene	Page, Larry	Wiegand, Art
Craft Rolf V.	Imig, Carroll E.	Peterson, Bob	Wiegand, Roy
Crowder, Brad	Kelley, Joe	Pingle, Fred	Wilcox, Wes
Davis, Chris	Kelley, Paul	Rassi, Joe	Wildermuth, Morris
Dickinson, Dick	Kelley, Tim	Reeser, Harold	Wilson, Doug
Dillon, Harlan	Kelly, Tim G.	Retzer, Dr. Michael	Winkler, Malcolm
Dravillas, Mark	Kemp, Chris	Reuter, Michael	Wissmiller, Michael E.
Dungey, Byron E.	Keturi, Glenn	Richter, Brian	Woodrow, Donna
Egolf, Russ	Killian, Tim	Rokey, Kenneth	
Elston, Sue	Kirchner, Jim	Roseboom, Don	

As of August 1998, the Mackinaw River Executive Committee will form the Mackinaw River Watershed Council, a permanent non-profit organization.

Table of Contents

Preface - 1
Section I, Introduction Section I - 1
Section II, Resource Inventory Section II - 1
Introduction1Location and Size of the Watershed1Water Quality3Political Jurisdictions3Demography5Land Use6Endangered Species7Public and Private Natural Areas8Wetlands9Soils9Soil Erosion and Land Management10Point Source Pollution and Wastewater Discharge13Conclusions15
Section III, Existing Water Protection Programs Section III - 1
Introduction
Section IV, Mackinaw River Watershed Action Plan Section IV - 1
Introduction

	_
Strategies	
Recommendations of the Planning Team	4
Agriculture	· 5
Strategy	
Recommendations	
Recommendation #1	
Recommendation #2	
Agriculture and Piological Diversity	0
Agriculture and Biological Diversity	
Strategy (Agriculture)	
Strategy (Biological Diversity)	
Joint Recommendations	
Recommendation #1	
Recommendation #2	
Recommendation #3	
Recommendation #4	14
Biological Diversity	17
Strategy	17
Recommendations	
Recommendation #1	17
Recommendation #2	19
Recommendation #3	20
Community Issues	21
Strategy	
Recommendations	
Recommendation #1	
Recommendation #2	
Recommendation #3	
Education	0.5
Education	
Strategy	
Recommendations	
Recommendation #1	
Recommendation #2	
Recommendation #3	28

Agency Coordir	nation	29
St	rategy	29
Re	ecommendations	29
	Recommendation #1	29
	Recommendation #2	30
	Recommendation #3	31
Gaps		33
Implementation		34
Other Proposals		34
Conclusions		35
References		36



Preface

From the Members of the Mackinaw River Executive Committee

A river can mean many different things to many different people. For some, it is a source of water for their homes or livestock. For others, it is a source of recreation; a place to enjoy fishing, boating, and/or nature watching. A river can be both a joy and a problem. For many of us, it has a potential to affect our lives, both positively and negatively. There are those who seek to control rivers, attempting to persuade them to conform to our needs. Others just want to leave them alone, and let a river do what a river will do.

Those of us who belong to the Executive Committee of the Mackinaw River Project have put forth a tremendous volunteer effort in order to craft a watershed management plan that will benefit not only those of us who will live and work along the Mackinaw River, but will benefit the river itself. We are all individuals for whom the Mackinaw River means different things. We have diverse viewpoints, interest, and ideas about the river and the project. But we were able to come together, meet with many other individuals and groups, learn more about rivers and watersheds, and then help in the development of this watershed management plan. Why did we do this? There are many different answers, but perhaps the one answer that we could all agree on is that in some way or another, we *care* about the Mackinaw River. It *does* affect our lives. We *do* want to see it flowing clear and clean, to remain a rich resource for future generations.

It was to this end, the protection and preservation of this resource, that our efforts to write a watershed management plan were directed. Those of us on the Executive Committee live and work within this watershed. We have history, experiences, and shared knowledge behind us. We have helped in writing a plan that we feel will work, not only for us, but for most of us who also live and work in this watershed. We have written this plan to be shared among all of its

residents, both rural and in communities. For this plan to be a success, everyone needs to see what changes they can make. It could be something very simple, such as creating a grass waterway. It could also be very complex and expensive, such as a sewage treatment facility. Changes do need to be made. And changes do present challenges and difficulties. However, the benefits obtained from making these changes will be real. The negative impacts that the river can make in our lives, such as flooding and contaminated water are significant. The positive impacts are also equally significant. Every person within this watershed, either directly or indirectly, benefits from a healthy river, from clean, clear water.

Please look at the Mackinaw River Watershed Management Plan carefully. Somewhere within this plan contains information relevant to you, a watershed resident. We hope that it will get you thinking about ways that you can make some changes that would benefit our watershed. It might prompt questions or concerns. Keep in mind that the recommendations contained in this watershed management plan are only that - recommendations. The final decision is up to you, to do something or do nothing at all. Those of us on the Executive Committee hope that you will decide to adopt this plan as your own, and start making those changes that will keep the Mackinaw River and its watershed a precious and viable resource for not just us, but for future generations to come.

Written by Mary Jo Adams, Secretary Mackinaw River Executive Committee

Section I Introduction

This document is a summary of the original Mackinaw River Watershed Management Plan, with four parts: Introduction, Resource Inventory, Existing Water Protection Programs - Agencies and Laws, and the Mackinaw River Watershed Action Plan. Appended to each section is a list of references that document facts cited in the report. Readers may find the original references useful for further investigation. This summary report contains almost all of the data tables from the full Mackinaw River Watershed Management Plan, excluding subwatershed plans, with abbreviated discussion. Readers who wish to investigate the extended discussions of issues presented here are encouraged to consult the full-length plan.

The Mackinaw River Project Planning Team worked with experts and Action Teams for over a year to pursue their initial purpose -- to form a Mackinaw River Watershed Management Plan, with agreed upon strategies, leading to achievable goals, to be met by specific recommendations. They agreed to work first toward correction of the problems that the Planning Team believed were most important to improve water quality.



Section II

Resource Inventory

Introduction

The Mackinaw River is a high quality stream with relatively high biological diversity. Nevertheless, excessive sedimentation and high stream flows following storm events are the primary influences that reduce water quality. These arrive in the river from nonpoint sources, so named because they are intermittent, diffuse runoff of pollutants from a variety of sources, including agriculture, construction erosion, urban runoff, hydrologic modifications, and resource extraction activities. Pollution from domestic and industrial wastewater. leaking underground storage tanks from gas stations, agricultural chemical handling facilities and many small industrial sites contribute nutrients and chemicals to the river and its' tributaries. To further reduce pollution effects in the river, agricultural land, most of which meets generally accepted criteria of less erosion than 'T', the rate of soil formation (NRCS, 1997), must be managed to further reduce soil erosion. Point source pollution from domestic sewage may be reduced by changing waste handling practices at a relatively few places. The water quality of the river and its' tributaries is affected by an accumulation of pollution and runoff. In order to achieve improved water quality, these diverse sources of pollution must be further reduced.

Location and Size of the Watershed

The Mackinaw River Watershed drains the fourth largest subwatershed of the Illinois River system, after the Spoon, LaMoine and Vermillion Rivers (IEPA, 1996), originating near Sibley, Illinois and joining the Illinois River at Pekin, Illinois. Major tributaries, from east to west, include Henline Creek, Turkey Creek, Money Creek, Sixmile Creek, Denman Creek, Panther Creek, Walnut Creek, Rock Creek, Mud Creek, Prairie Creek, Little Mackinaw Creek, Dillon Creek and Hickory Grove Ditch (Table II-1).

Table II-1

Major Tributaries of the Mackinaw River in 1994

Index of Biotic Integrity was predicted from specific habitat variables and should be compared only between streams of the same order. Quality is assessed from physical characteristics of the stream which determine aquatic habitat.

Section Rate P		Draina	ge Area		
Tributary	Order of Stream	Square Miles	Acres	Index of Biotic Integrity	Quality
Hickory Grove Ditch	4th	13.5	8,649	39.4	Moderate
Little Mackinaw River	4th	47.2	20,208	40.9	Moderate
Prairie Creek	3rd	24.0	15,360	40.3	Moderate to highly valued
Walnut Creek	4th	72.9	46,656	43.0	Highly valued
Money Creek	4th	71.3	45,632	33.1	Moderate
Henline Creek	3rd	34.9	22,336	38.2	Moderate

(Source: Short, M. B., T. G. Kelly, J. E. Heflley, and W. H. Ettinger. 1996. An Intensive Survey of the Mackinaw River Basin, 1994. Illinois Environmental Protection Agency, Division of Water Pollution Control, 4500 South Sixth Street Road, Springfield, Illinois 62706.)

Mackinaw River Watershed 1,138 sq. miles, 728,320 acres

Maximum elevation 951 feet

Minimum elevation 492 feet

Main channel 131 miles

Tributaries about 392 miles

Water Quality

Under the authority of the Clean Water Act (see Part III, Existing Water Protection Programs), the Illinois Environmental Protection Agency gathers data to enable the evaluation of water quality in Illinois streams and rivers. In 1987 and 1994, an intensive river basin survey was conducted to measure physical, chemical and biological parameters of the Mackinaw River and its' organisms throughout the year (Short et al., 1996). With the exception of the lower 7.7 miles, the Mackinaw River is rated as fully supporting the aquatic life use, the highest quality rating assigned. Those sections of the river and tributaries that did not receive the highest quality rating were comprised slightly to moderately by channelization in the lower 7.7 miles of the main channel, and by nutrients and sedimentation that affect Indian Creek, Mud Creek, Willow Creek, and Deer Creek. Illinois EPA reported that sediment and nutrients resulted from habitat modification, agricultural practices and point source municipal pollution. Interested readers are encouraged to consult the expanded Mackinaw River Watershed Management Plan, including Table II-2 (located at the end of this section).

Political Jurisdictions

Counties and Townships in the Mackinaw River Watershed include:

Tazewell County

Little Mackinaw; Hopedale; Dillon; Sand Ridge; Spring Lake (part); Cincinnati (part); Elm Grove; Tremont; Mackinaw; Morton (part); and Deer Creek.

McLean County

Cropsey; Anchor; Lawndale; Martin; Chenoa; Lexington; Blue Mound; Gridley; Money Creek; Towanda; Hudson; Normal (north); White Oak; Dry Grove and Danvers.

Woodford County

El Paso; Panola; Minonk; Clayton; Greene; Palestine; Kansas; Montgomery; Olio; Cruger; and Roanoke.

Livingston County

A very small part of Waldo Township.

Ford County

Part of Sullivant Township.

Mason County

Manito Township.

Table II-3

Towns in the Mackinaw River Watershed, 1990 Population

County	Municipality	1990 Population
Ford	Sibley	368
Mason	Manito	1705
	Total	2073
McLean (partial)	Lexington	1809
	Gridley	1304
	Hudson	1006
	Danvers	981
	Colfax	856
	Towanda	856
	Carlock	391
	Kappa	148
	Total	6495
Tazewell	Morton	13799
	Tremont	2088
	Mackinaw	1331
	South Pekin	1184
	Hopedale	794
	Green Valley	728
	Deer Creek	642
	Total	20,566
Woodford	Eureka	4435
	Metamora	2520
	El Paso	2483
	Roanoke	1910
	Goodfield	464
	Benson	407
	Congerville	386
	Secor	405
	Total	13,010
Total Watershed Population		42,144

Demography

Mackinaw River watershed residents numbered more than 70,000 persons in the 1990 U.S. Census (Table II-4) (US Census, 1990). About 53,000 people live in rural areas.

Table II-4 Demographic Characteristics of Mackinaw River Watershed Residents, extracted from 1990 US Census

Some township populations were estimated, based on area in the watershed. ^aPersons in "Towns and villages" and "Rural" do not add to "Total Population." For census purposes, most towns and villages in the watershed are classified "Rural"

	Tazewell	Woodford	McLean	Others	Total
	County	County	County		
			(partial)		
Total Population	33,264	18,139	17,199	3,355	71,957
% of Watershed	46.2%	25.2%	23.9%	4.6%	·
Towns and Villages ^a	20,566	13,010	6,495	2,073	42,144
% of Towns in Watershed	48.8%	30.8%	15.4%	4.9%	:
Rural ^a	18,593	13,704	17199	3,355	52,851
% County Population	55.9%	75.5%	100%	100%	73.5%
% of Rural Watershed	35.1%	25.9%	32.5%	6.3%	
Farm	1,528	2,207	1,969	276	5,980
% County Population	4.6%	12.2%	11.4%	8.2%	
% of Farm Population in Watershed	25.5%	36.9%	32.9%	4.6%	
Median Age	34	34	34	34	34
Median Household Income	\$30,933	\$34,375	\$34,949	\$26,369	\$33,215
% Households earning Farm Self- employment Income	3%	10%	11.7%	11.0%	
Persons Primarily Employed in	1,239	824	376	115	2,639
Farming	3.2%	2.5%	1.8%	3.4%	2.8%
Education (Age 18 and older)					
Less than High School	21.2%	19.6%	17.9%	26.3%	20.1%
High School Graduation	36.8%	37.7%	37.9%	49.2%	37.2%
More than High School	41.9%	42.6%	41.6%	24.3%	41.7%

Land Use

The Mackinaw River watershed includes 728,320 acres (Table II-5) (Eicken and Fitzgerald, 1988; cited in Gough, 1994; NRCS, 1997). Only 1 percent of the land is occupied for urban uses, and less than 1 percent for roads, railroads, and abandoned railroads.

Table II-5

Land Use in Mackinaw River Watershed

Land Cover Class	Acres	Square Miles	Percent of Watershed
High density urban	1,871.55	2.92	0.26
Medium density urban	2,809.31	4.39	0.39
Low density urban	2,475.70	3.87	0.34
Major roadways	3,552.40	5.55	0.49
Active railroads	1,245.02	1.95	0.17
Abandoned railroads	736.17	1.15	0.10
Row crop	542,372.20	847.46	74.46
Small grains	17,243.13	26.94	2.37
Urban grassland	4,397.75	8.87	0.60
Rural grassland	98,108.82	153.30	13.47
Deciduous forest: closed canopy	25,776.89	40.28	3.54
Deciduous forest: open canopy	9,873.46	15.43	1.36
Coniferous forest	192.58	0.30	0.03
Open water	3,204.17	9.54	0.44
Perennial streams	6,104.17	9.54	0.84
Shallow marsh/wet meadow	797.99	1.25	0.11
Deep marsh	37.30	0.06	0.01
Forested wetlands	6,007.56	9.39	0.23
Shallow water wetlands	1,671.63	2.61	0.23
Barren land	0.63	0.00	0.00
Totals	728,480.21	1,138.27	100.00

Source: Natural Resource Conservation Service, 1997. Mackinaw River Basin Inventory and Evaluation of Erosion and Sedimentation and an Assessment of the Conservation Treatment Needs. USDA, Natural Resource Conservation Service, 1902 Fox Drive, Champaign, IL 61820

Endangered Species

In the three counties comprising the largest portion of the Mackinaw watershed, McLean, Tazewell and Woodford, twenty-one species of animals that are endangered or threatened in Illinois have been recorded (see Table II-6, Herkert, 1991, 1992 - located at the end of this section).

Most are thought to be permanent or regular seasonal residents. Most require either rare habitats, such as prairie or savanna, or rare large tracts of forest. Thirty-three threatened and endangered plant species have been found in the watershed and nearby streams, including three which are threatened nationally. Rare species occur in unusual habitats, such as gravel islands in the shallow water areas of the Mackinaw and its' tributaries, rock outcrops and hill prairies, savannas, bottomland forests and wetlands. Many of these important species are in habitats protected by established natural areas and preserves, but others occur on privately owned land maintained as high quality biological resources by private landowners. The value of the forested areas along the Mackinaw River is especially great because a large contiguous tract provides habitat to some areasensitive species in addition to forming a causeway linking natural habitats along the river.

An expanded inventory of living resources has recently been published by the critical trends assessment program under the direction of Illinois Department of Natural Resources. This list includes plant, birds, mammals, insects, fish and fresh water mussels.

Public and Private Natural Areas

Natural habitat may be protected from development by one of several legal categories or by public or private ownership for wildlife habitat or recreational park uses. Protected areas in the Mackinaw River watershed include four Illinois Nature Preserves, a State Fish and Wildlife Area, a County Park, and several privately owned natural areas.

Nature Preserves hold the highest level of protection by Illinois law to protect high quality natural communities in perpetuity (McFall and Karnes, 1992). A Nature Preserve may be owned by the state, a private organization or individual. Nature Preserves in the Mackinaw River watershed at this time include Manito Prairie, Ridgetop Hill Prairie, Mehl's Bluff and ParkLands Nature Preserve, not to be confused with the Merwin Preserve, owned by ParkLands Foundation, a private foundation.

Other natural areas include several large tracts along the Mackinaw River that were established for a diversity of purposes. ParkLands Foundation, a private land-preservation trust founded in 1967 and funded entirely by member donations, protects and restores forests, savannas, prairies, wetlands, and shrubby grasslands along several miles of the Mackinaw River in McLean County, west of Lexington.

The Mackinaw River State Fish and Wildlife Area northeast of the Village of Mackinaw provides more than 500 acres for hunting and fishing. Forests, shrub and grassland areas protect the land, and support wildlife and a variety of native plant communities along the River (McFall and Karnes, 1992). Comlara Park, the McLean County park, surrounds the Evergreen Lake impoundment. Forests, fields, wetlands and restored prairies provide opportunities for nature observation and hiking, along with camping and boating facilities. Land surrounding Lake Bloomington, a drinking source, is subject to some regulation b the City of Bloomington, because of its importance. Home sites and a small park ring the lake. Lake Eureka was used as a water source until early 1995 and is surrounded by woodland and recreational development (Schneider et al., 1995).

Wetlands

Few large natural wetlands remain in the Mackinaw River watershed. Much of the headwaters area around Sibley was formerly a poorly drained marsh which absorbed rainfall and reduced runoff after rain events, compared to current conditions (USDA, 1990). In addition, most natural river systems have small wetlands associated with streamside areas where topography permits, also reducing runoff (Demissie and Kahn, 1993). None of these wetlands remain. Three man-made wetlands have been constructed in recent years, two are on tributaries to Lake Bloomington for controlling nitrogen entering the lake, and one near Sibley to reduce peak water flows of the Mackinaw. (James McMahon, The Nature Conservancy, Illinois Field Office, Mackinaw River Project, personal communication).

Loss of wetlands in the watershed is thought to contribute to increased peak flow and reduced low flow levels of rivers (Demissie and Kahn, 1993). Ten years of rainfall and flow records from 30 watersheds in Illinois, with and without wetlands, showed that, statewide, for each increase of 1 percent of the watershed in wetlands the peak flow was reduced 3.7 percent, while in central Illinois peak flow was reduced 8.7 percent for each 1 percent increase in wetlands (Demissie and Kahn, 1993).

Soils

Soil type and topography, as well as plant cover, determines the impact of stormwater runoff. Detailed soil surveys have been prepared by the USDA Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service), in cooperation with Illinois Agricultural Experiment Station, for all counties in the watershed. Maps and soil descriptions for Ford, Mason, and Tazewell Counties have been published and are available from NRCS offices. Other counties have detailed information available in unpublished form for use with large scale maps in the NRCS offices.

Soil Erosion and Land Management

Soil erosion is the removal of soil from a surface by wind or water. Water erosion is the primary form in the Mackinaw River watershed and results in sedimentation of waterways when surface soil is removed from bare land. Soil erosion rates are determined by rainfall totals and intensity, slope steepness and distance, soil texture, agricultural management and surface cover--vegetative, row crop or impervious.

Types of soil erosion, in increasing intensity include: sheet and rill erosion (removal of a thin layer of soil), ephemeral erosion (forms a small gully in a field), gully erosion (forming larger, more visible gullies with major soil loss), scour erosion (flood waters cross open unprotected land). All these types of soil erosion form from the force of rainfall falling on and flowing across soil surfaces. Streambank erosion occurs from the force of water flowing against the unprotected bank, a different process than sheet, rill and gully erosion. Faster stream flows during flooding exert greater force on the streambank, underminng the bank and causing erosion of large amounts of silt into the channel. Keeping water from entering the river system quickly after rains helps keep streambanks stable.

Soil erosion at a rate equal to the rate of soil formation is defined as 'T', or "tolerable," in terms of maintaining fertility on farmland. In the Mackinaw River valley 82 percent of watershed cropland is at 'T' or less than 'T'. Seventeen percent of cropland is estimated to erode at greater than 'T' (NRCS, 1997). According to NRCS data, sheet and rill erosion deliver the greatest quantity of sediment to the Mackinaw River, but significant amounts are also delivered by ephemeral, gully and streambank erosion (see Table II-7).

Table II-7 Annual Erosion and Sedimentation in the Mackinaw River Watershed

Erosion includes all soil that is loosened from a surface and has the potential to result in sediment in the waterway. Rate of sediment delivery is based on standard conversion factors for the types of erosion listed.

Туре	Erosion	Sediment Delivery	Sedimentation
	(tons)	(rate)	(tons)
Sheet & Rill	3,077,400	0.70	2,154,180
Ephemeral	280,000	0.80	224,000
Gully	250,000	0.85	212,000
Streambank	200,000	1.00	200,000
Total	3,807,400		2,790,180

(Source: NRCS, 1997.)

An estimated total of 2,154,180 tons of sediment are delivered to the river annually. Table II-7 shows that most of the total sheet and rill erosion comes from cropland that is at or below 'T', the accepted rate of erosion for maintenance of fertility, according to the Illinois Department of Agriculture. Lower rates of erosion may occur naturally in some parts of the watershed, or have been achieved by conversion of conventional farm practices to conservation tillage practices and other best management practices. These best management practices are designed to hold the water on the land longer and permit it to flow more slowly.

Current best management practices have reduced water erosion from formerly higher levels, but significant amounts of erosion remain due to the agricultural nature of the watershed. The USDA Conservation Reserve Program has enrolled 6,788 acres into permanent grass cover for ten or more years. About half of these contracts which removed fragile lands from crop production will expire by the year 2000 (NRCS, 1997).

Table II-8

Sheet and Rill Erosion in tons per acre per year from Cropland in the Mackinaw River Watershed

Erosion is calculated from acres eroding at acceptable levels or 0 to 1 'T' (3.5 tons per year), from slightly high levels of 1 to 2'T' (7.5 tons per year), and greater than 2 'T' (15 tons per year).

The watershed is distributed in the six counties as follows: McLean County 42%, Woodford County 28%, Tazewell County 26% and Ford, Livingston, and Mason Counties 4%.

County	0 to 1 'T'	1 to 2 'T'	Over 2 'T'	Total
McLean	897,225	281,250	93,750	1,272,225
Woodford	634,550	140,700	62,550	827,800
Tazewell	555,450	130,500	115,500	801,450
Ford, Mason and Livingston	86,555	24,525	9,000	120,080
Total	2,173,780	576,975	280,800	3,021,555

(Source: NRCS, 1997)

Although less than 5 percent of the Mackinaw River Watershed, urbanized areas and highways contribute greater runoff per acre than agricultural land uses. The use of impervious materials in urbanized areas reduces infiltration and increases runoff from those sites. Urbanized forested areas, housing developments among the forests of the river valley, fragment the forest and increase runoff from house and lawn sites. Erosion rates from construction sites are often 8 or more times higher than agricultural areas, carrying sediment that erodes from exposed soil (C. Davis, Illinois EPA, Bureau of Water, personal communication). Sediment control measures, such as those described in the "Tazewell County Erosion, Sediment and Stormwater Control Ordinance," are designed to minimize damage to surrounding waterways during construction activities. In addition, stormwater carries fertilizer nutrients and pesticides from urban lawns and streets. Stormwater detention basins or wetlands could filter sediment and chemicals from stormwater before it enters nearby waterways.

Streambank erosion occurs along the 522.3 miles of Mackinaw River and its tributaries, equaling 1,045 streambank miles, calculated by miles of stream times two banks, assuming all streams form a single channel. Based on aerial photos, approximately 102 miles of streambanks need stabilization, re-vegetation and protection to reduce streambank erosion (NRCS, 1997).

Point Source Pollution and Wastewater Discharge

A point source is one that enters the environment at a single location, such as a pipe or a ditch. Point source pollution in the Mackinaw River Watershed was assessed by an intensive study under the supervision of Professor Daniel Schneider of the University of Illinois Department of Urban and Regional Planning (Schneider et al. 1995). Land uses and sites which are at risk of producing point source pollution were identified through current records obtained from the Illinois Environmental Protection Agency (Illinois EPA), United States Environmental Protection Agency (U.S. EPA), Illinois State Geological Survey, Illinois State Water Survey (ISWS) and libraries of the University of Illinois. Sources in the watershed included leaking underground storage tanks, toxic releases to air, landfills, wastewater treatment plants, wildcat sewers, hazardous waste handling facilities, former coal gasification sites, surface and underground mine activity sites, and electrical substations and underground pipelines (Table II-9).

Table II-9
Potential Point Sources of Pollution in the
Mackinaw River Watershed

Identified by researchers in the Department of Urban and Regional Panning, University of Illinois, August 12, 1995.

Source	Ford	Mason	McLean	Tazewell	Woodford	Watershed
Registered Underground	18	26	68	189	201	502
Storage Tanks (USTs)	10	20	08	107	201	302
Leaking Underground Storage	2	1	25	40	39	107
Tanks			10			
Controlled or Permitted Toxic	0	0	13	33	11	57
Releases to Air						
Landfills	0	0	0	2	0	2
Wastewater Treatments Plants	0	1	6	12	4	23
Wildcat Sewers	0	0	0	1	4	5
RCRA-Waste Handling	0	0	0	1	1	2
Facilities						
Coal Gasification Plants (prior	0	0	0	0	1	1
to 1920s)						
Coal Mine sites	0	0	3	0	1	4

(Source: Schneider, D., R. J. Farrell, D. Fathke, J. Kowalski, T. Mahr. 1995. Point Source Pollution in the Mackinaw River Watershed. University of Illinois, Department of Urban and Regional Planning, 907 - 1/2 West Nevada, Urbana, Illinois 61801)

In addition, historic land uses for communities in the watershed were identified and may be consulted in the publication (Schneider et al. 1995). Both active and abandoned sites cause contamination of soil, but pollutants may be washed into waterways through erosion and movement of groundwater. Wastewater treatment plants and wildcat sewers discharge directly to waterways, adding fertilizer nutrients and suspended organic solids to the water.

Several communities discharge collector sewers into the tributaries or main stream of the Mackinaw River. In addition to human waste contamination, animal waste contamination was detected from the tests (Kelley, 1996). Communities with sewage treatment are listed in Table II-10 (located at the end of this section).

Conclusions

Table II-11 summarizes by source type the number and percentage of potential sources of stream impairment in the Mackinaw River Watershed, detailed by Short et al. (1996).

Table II-11
Summary of Potential Sources of Stream Impairment in the Mackinaw River Watershed (Summarized by Source Type)

Source Type	N	umber of P	otential Source	es		Percentage	
	Total	High	Moderate	Slight	High	Moderate	Slight
Agricultural	275	23	53	199	26.7	70.7	93.0
Municipal	54	44	8	2	51.2	10.7	0.9
Other	46	19	14	13	22.1	18.7	6.1
Totals	375	86	75	214	100	100	100

(Source: Short, M. B., T. G. Kelly, J. E. Hefley, and W. H. Ettinger. 1996. An Intensive Survey of the Mackinaw River Basin 1994. Illinois Environmental Protection Agency, Division of Water Pollution Control, 4500 South Sixth Street Road, Springfield, IL 62706.)

Agricultural sources present the largest number of sites, due to the predominance of agriculture in the watershed. However, most agricultural sources were rated as having "slight" potential for stream impairment, while more than half the municipal sources had a "high" potential for harm. The Mackinaw River Project plans to reduce the impact on the watershed from both agricultural and municipal pollution.

This summary report includes most of the tables from the full length Mackinaw River Watershed Management Plan. The report presents information collected for the Mackinaw River Project about the characteristics of the Mackinaw River watershed. Most of the information was obtained from public sources or with the assistance of employees in government agencies, detailed in the reference list. More detailed information can be obtained about any local area

in the watershed from many of the same sources. Assessment of conditions in the watershed and the causes of existing stresses on the river system permitted the Mackinaw River Project Planning Team and Action Teams to evaluate problems and set priorities for proposed solutions. The Planning Team will continue to use this and similar information to evaluate future recommendations.

Table II-2

Water Quality Rating and Supported Uses of the Mackinaw River and Tributaries, Causes and Sources of Impairments to Water Quality

a: Uses: Codes represent the following

02 = Fish consumption

04 = Supports aquatic life

05 = Swimming

b: Overall Status & Ratings: (Illinois EPA evaluations) include

F = Fully supported by water quality

T = Threatened; water quality may decline if current activities continue

R = Partial support / Minor impairment of water quality D = Partial support / Moderate impairment of water quality

N = Not supported by water quality

no code = indicates activity occurs, but no data available to determine if it should be supported

				no code = indica	no code = indicates activity occurs, but no data available to determine it it should be supported	s to determine it it snound be supported
Monitoring	Name	Miles	Overall	Uses " (rating ^b)	Uses a (rating b) Causes of Impairment	Sources Contributing to Impairment
Station			Status		And the second s	William Control of the Control of th
DK01	Mackinaw R.	7.71	×	02; 04(R); 05	Slight effects: nutrients, siltation	Slight contribution: agriculture, channelization, hydrologic/habitat
						modification
DK12	Mackinaw R.	20.75	拓	02; 04(F); 05(F)	THE RESERVE OF THE PROPERTY OF	and the state of t
DK19	Mackinaw R.	7.19	귀	02; 04(F); 05		
DKC01	Dillon Cr.	15.89	Н	02; 04(F); 05		
DK04	Mackinaw R.	9.95	F	02; 04(F); 05(N)	A SAME AND	
DK15	Mackinaw R.	3.99	Ä	02; 04(F); 05(N)		
DK13	Mackinaw R.	5.66	ᄺ	02; 04(F); 05(R)		
DK16	Mackinaw R.	5.70	F	02; 04(F); 05(N)		
DKH01	Alloway Cr.	90'9	ш	02; 04(F), 05		
DK101	Rock Cr.	17.60	ഥ	02; 04(F); 05		
DKIA	Funks Branch	5.22	ĹL.	02; 04(F); 05		
DKZF	Hollands Cr.	2.88	F	02; 04(F); 05	Linda Branch and Control of the Cont	
DK20	Mackinaw R.	15.28	Ŧ	02; 04(F); 05		
DK17	Mackinaw R.	8.50	щ	02; 04(F); 05		
DK18	Mackinaw R.	17.39	দ	02; 04(F); 05		
DK21	Mackinaw R.	20.97	i.	02; 04(F); 05		
DKM01	Denman Cr.	99.6	F	02; 04(F); 05		
DKN01	Sixmile Cr.	27.88	F	02; 04(F); 05	The state of the s	

Monitoring	Name	Miles	Overall	Uses a (rating b)	Causes of Impairment	Sources Contributing to Impairment
Station			Status ^b			
DKO01	Wolf Cr.	3.49	4	02; 04(F); 05		
DKR01	Buck Cr.	12.10		02; 04(F); 05		
DKS	Turkey Cr.	10.96	1	02; 04(F); 05		
DKU	Patton Cr.	5.02	ن:	02; 04(F); 05		
DKZG	Loving Branch	2.91	ᆢ	02; 04(F); 05		
DKB01	Hickory Grove Dt.	3.00		02; 04(F); 05		
DKB01	Indian Cr.	80.9	Q	02; 04(D); 05	Moderate effects: nutrients, siltation.	
					Slight effects: organic enrichment/ Dissolved oxygen, Flow alteration	pollution; <u>Slight contribution</u> : agriculture, hydrologic or habitat alteration, channelization
DKE01	Little Mackinaw R.	17.13	ĹŦ.,	02; 04(F); 05		
DKEA	Sargent Slough	9.43	Н	02; 04(F); 05		
DKF11	Prairie Cr.	13.92	F	02; 04(F); 05		
DKG01	Mud Cr.	17.89	R	02; 04(R); 05	Slight effects: nutrients. Moderate effects: silpation	Moderate contribution: agriculture
DKGA	Willow Cr.	3.77	×	02: 04(R): 05	Slight effects: nutrients.	Moderate contribution: agriculture
					Moderate effects; siltation.	
DKGB	Deer Cr.	13.69	R	02; 04(R); 05	Slight effects: nutrients. Moderate effects; siltation	Moderate contribution; agriculture
DKJ01	Walnut Cr.	23.40	Ŗ	02; 04(F); 05		
DKJA	Mill Cr.	5.68	H	02; 04(F): 05		
DKK01	Panther Cr.	4.96	F	02; 04(F); 05		
DKK02	Panther Cr.	19.42	F	02; 04(F); 05		
DKKA	Olive Brch.	4.47	F	02; 04(F); 05		
DKKG	Red R.	7.50	F	o2; 04(F); 05		
DKKB01	W. Panther Cr.	14.01	Ĭ	02; 04(F); 05		
DKKC02	E. Panther Cr.	12.02	F	02; 04(F); 05	4 10 10 10 10 10 10 10 10 10 10 10 10 10	
DKP02	Money Cr.	44.11	ഥ	02; 04(F); 05		
DKV01	Henline Cr.	14.42		02; 04(F); 05		
	Crooked Cr.	_	F	02; 04(F); 05		
	111: III O III- D	1	Volume I and Il	T Court of Illinois L	Chat of Illinois Emissonmental Duotoction Aconon. IED A/ROW/OK OKO Contombor 100K	DOMINOR OKO Contombon 100K 1

(Source: Illinois Water Quality Report, Volumes I and II. State of Illinois Environmental Protection Agency. IEPA/BOW/96-060. September 1996.)

Table II-6

Endangered Species Reported to Occur in Tazewell, Woodford and McLean Counties

IL= Illinois Status Status key: E=Endangered T=Threatened

US= Federal Status

Invertebrates

Species	Common Name	Status	Habitat		Counties	
				Tazewell	Woodford	McLean
Alasmodonta viridis	Slippershell (mussel)	E (IL)	Stream, sandy bottom, clean water		×	×
Lasmigona compressa	Creek heelsplitter (mussel)	T (IL)	Creeks, clean water, fine gravel or mud bottoms,		×	×
			riffles			
Lampsilis higginsi	Higgin's eye pearly mussel	E (IL, US)	River, mud-gravel substrate	x		
Uniomeris tetralasmus	Pondhorn (mussel)	T (IL)	Creeks, clean shallow water, mud bottom		×	X
Villosa iris	Rainbow (mussel)	E (IL)	Shallow creeks, below riffles, sandy or sand/mud			×
			bottoms)			

Amphibian

Species	Common Name	Status	Habitat	:	Counties	
}				Tazewell	Woodford	McLean
Pseudacris streckeri	Illinois chorus frog	T (IL)	Open sandy areas of river	×		
			lowlands			

Summary of the Mackinaw River Watershed Management Plan

Reptiles

Species	Common Name	Status	Habitat		Counties	
				Tazewell	Woodford	McLean
Heterodon nasicus	Western hognose snake	T(IL)	T (IL) Dry prairies	×		
Kinosternon flavescens	Illinois mud turtle	E(IL)		×		
			sand areas.			

Fish

Species	Common Name	Status	Habitat		Counties	
•				Tazewell	Woodford	McLean
Lepomis punctatus	Spotted sunfish	T (IL)	Vegetated bottomland lakes	×		
			over mud or sand, clean			
			water			

Birds

Species	Common Name	Status	Habitat		Counties	
•				Tazewell	Woodford McLean	McLean
Accipiter cooperi	Cooper's hawk	E (IL)	E (IL) Mature forests, forest edge			×
Assio flammeus	Short-eared owl	E (IL)	E (IL) Large grasslands			×
Bartramia longicauda	Upland sandpiper	E (IL)	E (IL) Large short grasslands, pastures			×
Casmerodius albus	Great egret	E (IL)	E (IL) Flood plain forest	×	×	
Catharus fuscescens	Veery	T (IL)	T (IL) Large forests	x		×

Section II - Page 20

Summary of the Mackinaw River Watershed Management Plan

Birds (continued)

Species	Common Name	Status	Habitat		Counties	
4				Tazewell	Woodford	McLean
Certhia americana	Brown creeper	T(IL)	Floodplain forests, old trees		×	:
Ixobrychus exilis	Least bittern	E(IL)	Marsh & shallow lakes	×		
Lanius ludovicianus	Loggerhead shrike	T (IL)	Mixed agric., shrubs, grassland	×		×
Nycticorax nycticorax	Black-crowned night heron	E(IL)	Bottomland forests and marsh	×		×
Pandion haliaetus	Osprey	E(IL)	Near lakes, rivers	X		
Podilymbus podiceps	Pied-billed grebe	E (IL)	E (IL) Large wetlands	×		×

Mammals

Species	Common Name	Status	Habitat		Counties	
				Tazewell	Woodford	McLean
Lutra canadensis	River ofter	E(IL)	Extensive woodlands with		×	
			riparian habitat			

Plants

Species	Common Name	Status	Habitat		Counties	
				Tazewell	Woodford	McLean
Agropyron subsecundum	Bearded wheatgrass	E(IL)	Mesic prairies, wet dolomite	×		
			outcrops			

Plants (continued)

Arctostaphylos uva-ursi B		Status	Habitat		Counties	
				Tazewell	Woodford	McLean
	Bearberry	E (IL)	Sand deposits, sandstone outcrops	×		
Aster schreberi Sc	Schreber's aster	T (IL)	Rich mesic ravine forests	×		
Astragalus tennesseensis Te	Tennessee milk-vetch	E (IL)	Dolomite and dry gravel prairies	×		
Berberis canadensis A.	Alleghany barberry	E(IL)	Sandstone bluff		×	
Besseya bullii K	Kitten tails	T (IL)	Sand savannas, dry gravel prairies	×		
Boltonia decurrens D	Decurrent false aster	T (IL) T (US)	Floodplain temporary habitats	×	×	-
Carex laxiculmis Sp	Spreading sedge	E(IL)	Mesic forests	×		
Cypripedium candidum W	White lady's slipper	E(IL)	Wet-mesic prairies		×	×
Cypripedium reginae St	Showy lady's slipper	E(IL)	Variety of moist habitats	×	×	
Epilobium strictum Do	Downy willow herb	T(IL)	Open calcareous bogs, fens, seeps		×	
Filipendula rubra Qı	Queen-of-the-prairie	T (IL)	Fens, mesic sand prairies, seeps	×		
Helianthus giganteus Ta	Tall sunflower	E(IL)	Fens and sedge meadows		×	
Hymenoxys acaulis var. glabra La	Lakeside daisy	E (IL) T (US)	Dolomite prairies	×		
Liatris scariosa var. nieulandii Bl	Blazing star	T (IL)	Siit-Ioam savannas			×

Summary of the Mackinaw River Watershed Management Plan

Plants (continued)

Species	Common Name	Status	Habitat		Counties	
				Tazewell	Woodford	McLean
Microseris cuspidata	Prairie dandelion	E(IL)	Dry-mesic prairies	×		
Milium esfusum	Millet grass	E (IL)	Openings in hardwood forests			
Mimulus glabratus	Yellow monkey flower	E(IL)	Calcareous seeps		×	
Orobanche Iudoviciana	Broomrape	E(IL)	Blowouts in dry and sand prairies, alluvial floodplains	×		
Plantago cordata	Heart-leaved plantain	E (IL)	Sand or gravel bars of shallow, clear-water streams under a forest canopy.		×	
Plantathera Java var herbiola	Tubercled orchid	T (IL)	Wet-mesic sand prairies and associated thickets	×		
Plantathera leucophaea	Prairie white-fringed orchid	E(IL) T(US)	Mesid to wet prairies			×
Polanisia jamesii	James' clammyweed	E(IL)	Colonizing species of open sand prairies	×		
Rhamnus alnifolia	Alder buckthorn	E(IL)	Calcareous bogs, sand prairies, fens	×		
Spiranthes lucida	Yellow-lipped ladies' tresses	E (IL)	Calcareous habitats		×	
Thuja occidentalis	Arbor vitae	T(IL)	Lake Michigan glacial bluffs, adjacent ravines, sandstone and limestone cliffs, forested fen		×	
Triglochin maritima	Common bog arrowgrass	E(IL)	Fens and interdunal swales		×	
Triglochin palustris	Slender bog arrowgrass	E(IL)	Spring runs in fens and interdunal swales		×	

Plants (continued)

Species	Common Name	Status	Habitat		Counties	
				Tazewell	Tazewell Woodford McLean	McLean
Veratrum woodii	False hellebore	T(IL)	Mesic upland and ravine			×
			forests			
Veronica americana	American brooklime	E(IL)	Wet ground around seeps,	х		
			springs, streams marshes			
			and fens			
Veronica scutellata	Marsh speedwell	T(IL)	Marshes, wetlands		×	

(Source: Herkert, J. 1991 and 1992.. Endangered and Threatened Species of Illinois: Status and Distribution. Volume 1 - Plants. Volume 2 - Animals. Illinois Endangered Species Protection Board. Springfield, Illinois.)

Identified Public and Industrial Sewage Treatment Facilities in the Mackinaw River Watershed

"No sewers" indicates the town has no collection system. "Wildcat sewers" are sanitary sewers that discharge untreated domestic waste into a water source.

Community	Type of Facility	Most Recent Construction	Discharge to Stream
FORD COUNTY			
Sibley	No sewers		
McLEAN COUNTY			
Anchor	No sewers		
Carlock	No sewers		
Colfax	Secondary treatment	1990	Mackinaw River
Cooksville	No sewers		
Gridley	Secondary	1976	Buck Creek
Hudson	No sewers		
McLean County Parks & Recreation (Comlara Park)	Tertiary	mid-1970's	Evergreen Lake
East Bay Camp	Tertiary	mid-1970's	Lake Bloomington
Lexington	Some sewers, No treatment		Turkey Creek
Towanda	No sewers		
Grade School	Secondary	1991	Tributary of Money Creek
Unocal Corporation - Zorn Transport	No data	1993	No data
MASON COUNTY			
Manito	Secondary	1975	Hickory Grove Ditch
TAZEWELL COUNTY			
Deer Creek	Secondary	1990	Mud Creek
Green Valley	Secondary	1980	Mackinaw River
Hopedale	Secondary	1971	Indian Creek
Indian Creek Industrial Park	Secondary	1977	Indian Creek
Mackinaw	Secondary	1985	Mackinaw River
Morton	Advanced secondary	1972	Prairie Creek
Libby Pumpkin Cannery/Nestle	Secondary	1972	Land application
South Pekin	Wildcat sewer, No treatment		Ditch draining to Mackinaw River.
Tremont	Secondary	1986	Dillon Creek
Grandview Homeowners	Secondary	1971	Prairie Creek
Tazewell County Health Facility	Secondary	NA	Dillon Creek

Community	Type of Facility	Most Recent Construction	Discharge to Stream
WOODFORD COUNTY			
Benson	Wildcat sewer, No treatment		Panther Creek
Congerville	Secondary	1964	Mackinaw River
Congerville area	Wildcat sewer, No treatment		Rock Creek
El Paso	Secondary	1968	panther Creek
Woodford County Swine Breeders	Treatment, unknown type		Panther Creek
Eureka	Advanced secondary	1973	Walnut Creek
IDOT Rest Area #1	Secondary	1972	Mackinaw River
IDOT Rest Area #2	Secondary	1972	Mackinaw River
Goodfield	Secondary	1980	Mackinaw River
Timberline Mobile Homes	Secondary	1975	No data
Metamora	Secondary	1979	Walnut Creek
Roanoke	Secondary	1970	Panther Creek
N/A near Kappa	Wildcat sewer, no treatment		Mackinaw River
N/A near Secor	Wildcat sewer, no treatment		Panther Creek
Excel Foundry	Cooling pond	1983	Mackinaw River

(Source: Schneider, D., R. J. Farrell, D. Fathke, J. Kowalski, T. Mahr. 1995. Point Source Pollution in the Mackinaw River Watershed. University of Illinois, Department of Urban and Regional Planning, 907 - 1/2 West Nevada, Urbana, Illinois 61801)

References

- Demissie, M. and A. Khan. 1993. Influence of wetlands on streamflow in Illinois.

 Illinois State Water Survey, Hydrology Division, Champaign, IL, Contract Report 561. Prepared for the Illinois Department of Conservation.
- Eicken, G. and W. Fitzgerald. 1988. The Mackinaw River Basin watershed inventory. Association of Illinois Soil and Water Conservation Districts (no address given).
- Gough, S. 1994. Geomorphic reconnaissance and draft management strategy for the Mackinaw River ecosystem, Illinois. The Nature Conservancy, Central Illinois Field Office, 416 Main St., Suite 1112, Peoria, IL 61602.
- Herkert J., ed. 1991. Endangered and threatened species of Illinois: status and distribution. Volume 1 Plants. Illinois Endangered Species Protection Board, Springfield, Illinois.
- Herkert, J., ed. 1992. Endangered and threatened species of Illinois: status and distribution. Volume 2 - Animals. Illinois Endangered Species Protection Board, Springfield, Illinois.
- Kelley, T. 1996. Monitoring of physicochemical indicators of pollution in the Mackinaw River. Report to The Nature Conservancy Mackinaw River Project (Illinois Field Office). Department of Health Sciences, Campus Box 5220. Illinois State University, Normal Illinois 61790-5220.
- McFall, D. and J. Karnes, eds. 1992. A directory of Illinois Nature Preserves. Volume 2. Illinois Department of Natural Resources, Division of Natural Heritage., Springfield. Illinois.
- [NRCS] Natural Resources Conservation Services. 1997. Mackinaw River Basin Inventory and Evaluation of Erosion and Sedimentation and an Assessment of the Conservation Treatment Needs. USDA Natural Resource Conservation Service. 1902 Fox Drive, Champaign, IL 61820.
- Schneider, D., R. J. Farrell, D. Fathke, J. Kowalski, T. Mahr. 1995. Point source pollution in the mackinaw River watershed. University of Illinois Department of Urban and Regional Planning, 907-1/2 West Nevada, Urbana, Illinois 61801.
- Short, M. B., T. G. Kelly, J. E. Heflley, W. H. Ettinger. 1996. An Intensive Survey of the Mackinaw River Basin, 1994. Illinois Environmental Protection Agency, Division of Water Pollution Control, 4500 South Sixth Street Road, Springfield, Illinois 62706.

- U.S. Census 1990. Accessed through World Wide Web at http://venus.census.gov/cdrom/lookup/
- United States Department of Agriculture, Soil Conservation Service. 1990. Soil Survey of Ford County, Illinois. Illinois Agricultural Experiment Station Soil Report No. 128.
- United States Department of Agriculture, Soil Conservation Service. 1995. Soil Survey of Mason County, Illinois. Illinois Agricultural Experiment Station Soil Report No. 146.
- United States Department of Agriculture, Soil Conservation Service. 1996. Soil Survey of Tazewell County, Illinois. Illinois Agricultural Experiment Station Soil Report No. 153.
- United States Department of Agriculture, Soil Conservation Service. unpublished soil reports of Livingston County, McLean County and Woodford County. Available from USDA Soil Conservation service, 951-2 West Spresser, Taylorville, IL 62568.

Section III

Existing Water Protection Programs – Agencies and Laws

Introduction

Existing programs which influence the quality of water in the Mackinaw River and its' tributaries are spread among all levels of government, federal and state laws, county ordinances, as well as voluntary programs. Many human activities which ultimately effect Illinois' water resources are regulated by enforcement programs, such as control of point source pollution from industry and sewage treatment plants, homeowner sewage treatment systems and animal waste disposal structures. Other activities, particularly agricultural practices, are more likely to be affected by incentive programs and technical assistance offered through a combination of federal, state and local government.

Table III -1
Entities with Programs that Affect Water Quality in the Mackinaw River Watershed

Entity	Program
Federal	US Department of Agriculture
	USDA Natural Resource Conservation Service
	US Army Corps of Engineers
	US Department of Interior
State	Illinois Environmental Protection Agency
	Illinois Pollution Control Board
	Illinois Department of Agriculture
	Illinois Department of Public Health
	Illinois Department of Natural Resources
	Illinois State Water Survey
	Illinois Natural History Survey
	Illinois State Geological Survey
	Illinois Stream Information Service
Local	Soil and Water Conservation District
	County Government
	County Health Departments
	Municipalities
	Tri-County Regional Planning Commission
	Drainage Districts

Table III - 2
Important Programs and Laws that Affect Water Quality

Entity	Program
Federal	Clean Water Act
	1985 Food Security Act
	1995 Market Transition Act
	National Environmental Policy Act
State	Illinois Environmental Protection Agency
	Illinois Livestock Waste Regulations
	Build Illinois Conservation Practices Program
	Watershed Land Treatment Program
	Conservation 2000 Program
	Interagency Wetland Policy Act
	Illinois Public Health Act
	Illinois Private Sewage Disposal Code
Local	Model Soil Erosion Control Ordinance
	County Zoning Ordinances
	Municipal Ordinances
	County Private Sewage Disposal Ordinances

Both voluntary and regulatory programs exist at the federal, state and local levels. Even more confusing, entities at the federal, state and local levels provide administrative services for most of these programs. Entities from one level may administer programs at multiple levels. In the Mackinaw River watershed, entities with programs include federal, state and local agencies shown in Table III-1. Some important laws that affect water quality are listed in Table III-2.

Illinois Environmental Protection Agency (Illinois EPA)

As part of its responsibilities, Illinois EPA implements the several federal and state laws that protect water quality, the federal Clean Water Act (CWA) and the Illinois Environmental Protection Act, regarding water pollution, agricultural related water pollution, field application of livestock waste; public waste supplies. Illinois EPA shares responsibility with the Illinois Pollution Control Board, described below.

Federal and state laws provide state agencies with authority for regulation of activities which influence water quality and also mandate enforcement agencies to obtain information about water quality, for setting standards and determining water quality trends. The federal water pollution control law, the Clean Water Act (33 U. S. C. § 1251 et seq.), prohibits "the discharge of any pollutant by any person" except in compliance with the law (Section 301) (Sullivan, 1995). Although the law applies to the entire nation, responsibility for establishing permit limits, inspection and enforcement is normally transferred to the pertinent state, in this case, the Illinois Environmental Protection Agency. Both point source and nonpoint source pollutants are regulated by the Clean Water Act.

As the law is applied, a "permit to discharge pollutants," called National Pollutant Discharge Elimination System (NPDES) permit, is required for the operation of municipal wastewater treatment plants and industries. Nonpoint source pollution is addressed in the Clean Water Act by mandating each state designated water pollution control agency to develop programs to reduce nonpoint source pollution from sources such as agricultural and urban stormwater runoff, including soil erosion from construction activities. Animal wastes generated by feedlot operations are regulated by **Illinois Livestock Waste Regulations** (Illinois Administrative Code, Title 35, Parts 501-505) (Illinois Gateway). A NPDES Permit from Illinois EPA is required for some facilities. Regulations have been approved by the **Illinois Pollution Control Board** (Title 35, Part 505, see Illinois Pollution Control Board, below) (Illinois Gateway).

In addition to the state and federal laws to control nonpoint source pollution, counties and municipalities have developed **county and municipal ordinances** which may require more stringent control measures for control of soil erosion through building permits. For example, Tazewell and Woodford counties have adopted the **Model Soil Erosion Control Ordinance** developed by the **Tri-County Regional Planning Commission** (Tazewell County). All counties in the watershed conduct zoning activities through an office of their county government.

Illinois Pollution Control Board

The Illinois Pollution Control Board is a quasi-legislative and quasi-judicial body created by the Illinois Environmental Protection Act ([PCB], 1997). As an agency for the State of Illinois, it adopts standards and regulations for activities that result in pollution of the environment, in order to meet federal environmental protection laws. Among its activities as an environmental court of law, it hears contested cases involving decisions of the Illinois EPA, as well as local government citing decisions about pollution control facilities (Illinois Administrative Code, Title 35, Parts 200-1400). Livestock waste regulations were approved by the Illinois Pollution Control Board (Illinois Administrative Code, Title 35, Parts 501-505).

Illinois Department of Agriculture (Illinois DOA)

The Illinois Department of Agriculture (Illinois DOA) promulgates programs established by the U.S. agriculture laws, as well as those established by the Illinois General Assembly. Agricultural crop production may result in increased soil erosion and pesticide or fertilizer runoff. Programs administered through Illinois Department of Agriculture Conservation Practices Program and Watershed Land Treatment Program encourage voluntary Best Management Practices and the implementation of conservation tillage to reduce soil erosion on highly erodable acres. The goals of Illinois T-2000 are to encourage farm practices to reduce soil erosion to the rate of soil formation 'T' by the year 2000, in order to conserve productive capacity of soils and improve water quality.

The <u>Landowners Guide to Natural Resources Management Incentives</u>
([NRCC], 1997) provides extensive information about specific programs and incentives available to landowners. Illinois DOA works with local **Soil and**Water Conservation Districts to administer many of these programs, including portions of the Conservation 2000 Program and the Build Illinois Conservation Practices Program.

Soil and Water Conservation Districts (SWCD)

Soil and Water Conservation Districts (SWCD) have been established by local vote of property owners. They are the purveyors of natural resource information at the local level, and as such act as a unit of local government. District Directors are elected by local landowners. As identified in the Illinois Soil and Water Conservation District Act, the districts have the mission to be responsible for the protection and conservation of soil and water and related resources. Soil and ... Water Conservation District personnel maintain land use records, including locations utilizing specific conservation practices ([SWCD]).

Natural Resources Conservation Service (NRCS)

Personnel of the USDA Natural Resources Conservation Service (NRCS) provide technical assistance through the Soil and Water Conservation Districts. The NRCS, formerly Soil Conservation Service, was established by the U. S. Department of Agriculture as a means to implement conservation practices mandated under the federal agriculture legislation and to assist local agricultural producers.

Federal agriculture laws, e.g., 1985 Food Security Act, 1995 Market

Transition Act, provide conservation programs which reduce soil erosion,
primarily the Conservation Reserve Program and the Wetland Reserve

Program, administered through the U. S. Department of Agriculture NRCS. These
programs are implemented at the federal level, but participants sign up at the local
level. Agricultural activities also have the potential to destroy critical wetland
habitat. The 1985 Food Security Act, Swampbuster Provision denies
participation in USDA Farm Program benefits to any landowner and/or operator
who destroys wetlands for agricultural production.

Other Agencies

Illinois EPA shares responsibilities for monitoring of water supplies and quality with the Illinois State Water Survey, the Illinois State Geological Survey, the Illinois Stream Information Service maintained by the Illinois Natural History Survey, and the Illinois Department of Natural Resources.

Protection of wetlands is required by the Clean Water Act Section 404 and the 1985 Food Security Act / Swampbuster Provision, and in Illinois, is controlled through an Interagency Wetland Policy Act, an agreement between Illinois EPA, Illinois Department of Natural Resources and Illinois Department of Agriculture ([Illinois EPA]). A National Wetlands Inventory map, prepared by Illinois Department of Natural Resources (at the time Department of Conservation) in conjunction with the U.S. Department of the Interior, provides information needed by Natural Resources Conservation Service and Illinois EPA.

US Army Corps of Engineers (USACE)

Wetlands and floodplains are important for controlling stream flow and maintaining high water quality. The U.S. Army Corps of Engineers (USACE) regulates activities in floodplains, such as construction, dredging and filling, by issuing permits in compliance with the Clean Water Act Section 404. In addition, the National Environmental Policy Act requires the Corps to minimize or prevent environmental impact in national waterways. All counties in the Mackinaw watershed regulate construction, as well as dredge and fill activities, in floodplains, through local zoning ordinances or through a soil erosion ordinance.

Local **Drainage Districts**, which encompass the watershed of small or large streams, were organized in the early part of the 20th century, for the purpose of building and maintaining drainage ditches to foster agricultural development. An Inventory of Illinois Drainage and Levee Districts (State of Illinois, 1971) listed active and inactive drainage districts at the time of publication, acreage,

Township-Range location, and included detailed maps. Some are still in existence. Much of Illinois' agricultural landscape is drained, contributing to loss of original wetland habitat. Channelized streams were straightened and deepened, in an effort to speed removal of water from fields. However, water that rapidly flows off upland areas often causes flooding downstream. As a result, stream channelization is often thought to conflict with protection of water quality.

Illinois Department of Public Health

Certain environmental protection activities are regulated because they have importance to public health. The Illinois Department of Public Health, with its County Departments of Health, is responsible for setting standards and enforcing regulations for sources and treatment of drinking water, protecting recreational waters and regulating private sewage disposal (77 Illinois Administrative Code, Chapter 1, subchapter, Part 905). Requiring homeowners to meet the Private Sewage Disposal Code ([PSDC]) protects the aquatic environment and improves water quality, in addition to preventing spread of human disease. Local Public Health Departments are responsible for enforcement. County ordinances have been adopted for private sewage disposal by all counties in the Mackinaw River Watershed.

Table III-3 (located at the end of this section) summarizes the programs and agencies which operate to reduce the negative impact of human activities on water quality. Agricultural programs are summarized from the <u>Landowners Guide to Natural Resources Management Incentives</u>, written by the Illinois Natural Resources Coordinating Council ([NRCC], 1997). Programs developed to control nonpoint source pollution under mandates of the Clean Water Act Section 319 are summarized from "Illinois' Nonpoint Source Management Program," Illinois EPA, Bureau of Water, IEPA/WPC/94-243 ([IEPA], 1994).

Table III - 3
Existing Programs that Protect Water Quality from Pollutants

Activity	Pollutants	Protection Activities Accessed
Activity	1 onutants	Protection Activities, Agencies and Programs
		Trograms
Agriculture crop production	Soil erosion, pesticide and fertilizer runoff	Voluntary incentive programs to encourage best management practices. IEPA -Clean Water Act, Section 319 IDOA -Conservation Practices Program, Watershed Land Treatment Program, Illinois T-2000. Best management practices, conservation tillage SWCD, NRCS local enrollment
Agriculture animal production	Animal wastes: Nutrients, bacteria, un-decomposed organic matter, land application and manure lagoons	Regulations: IEPA –Clean Water Act Illinois Pollution Control Board Illinois Livestock Waste Regulations. NPDES permit required for some facilities Best Management Practices
Habitat destruction: wetland destruction, stream channelization	Loss of critical habitat, habitat and stream channel destruction downstream from channelization	USDA –1985 Food Security Act/Swampbuster Provision. IEPA –Clean Water Act Section 404, IEPA, IDNR, IDOA Illinois Interagency Wetland Policy Act US Army Corps of Engineers Definitions: US Fish and Wildlife Service
Dredge and Fill disposal, potential damage to flood plain and areas near waterways	Soil-borne pollutants (nutrients, toxic chemicals), destruction of wetlands	IEPA –Clean Water Act prohibits dumping, unless under Sec. 404 permit, in compliance with National Environmental Policy Act. US Army Corps of Engineers issues permits and designates dumping areas
Construction, especially of housing developments and highways.	Soil erosion	IEPA -Clean Water Act, Section 319 programs. County Zoning OfficesEnforce county and municipal soil erosion control ordinances, through building permits

Table III-3
Existing Programs that Protect Water Quality from Pollutants (continued)

Activity	Pollutants	Protection Activities, Agencies and Programs
Stormwater	Spills from industry and commercial sites	IEPA –Clean Water Act (1987 amendments) Stormwater permits, Best Management Practices, Spill notification requirements
Municipal sewage	Nutrients, few toxic substances	IEPA -NPDES Permit limitations
Private sewage disposal (Septic systems, drain fields, aerators)	Nutrients, bacteria, un-decomposed organic matter, household chemicals	County Departments of Public HealthEnforce County ordinances, which must equal or exceed state IDPH regulations. Enforced through minimal lot size for building and septic installation inspections.
Trailer parks, sewage disposal	Nutrients, bacteria, un-decomposed organic matter, household chemicals	IEPA -Clean Water Act, NPDES permits
Recreational parks, sewage disposal	Nutrients, bacteria, un-decomposed organic matter, household chemicals	IEPA –Clean Water Act, NPDES permits.
Industry, discharge to waterbody	Nutrients, toxic substances	IEPA -Clean Water Act, NPDES Permit limitations
Industry, discharge to public sanitary sewer system	Nutrients, toxic substances	IEPAClean Water Act, Pretreatment program
Power plants	Thermal discharge (usually hot water effluent)	IEPA -Clean Water Act, Section 316

Source: Illinois' Nonpoint Source Management Program. 1994. Illinois Environmental Protection Agency. IEPA/WPC/94-243. Illinois EPA, Bureau of Water, P.O. Box 19276, Springfield, IL 62793-9276.

References

- [CWA] Clean Water Act. 33 U. S. C. § 1251 et seq. Section 101(a)(1) and (2), 33 U.S. C. Par. 1251(a)(1) and (2).
- Illinois Gateway. (no date) The Department of Index, Illinois Administrative Code Table of Contents. http://www.sos.state.il.us/depts/index/code/title.html
- [Illinois EPA] Illinois Environmental Protection Agency. 1994. Illinois' Nonpoint Source Management Program. IEPA/WPC/94-243. IEPA, Bureau of Water, 2200 Churchill Road, Springfield, IL 62794-9276.
- [NRCC] Landowners guide to Natural Resources Management Incentives. 1997. Illinois Natural Resources Coordinating Council. Illinois Department of Natural Resources, 325 West Adams Street, Springfield, IL 62704-1892.
- [PCB] Citizens Information Guide. 1997. Illinois Pollution Control Board, James R. Thompson Center, Suite 11-500, 100 W. Randolph St., Chicago, IL 60601. http://www.state.il.us/pcb/citizens/citizn_a.htm
- [PSDC] Private Sewage Disposal Code. 77 Illinois Administrative Code Chapter I, Subchapter r, Part 905. Available from Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson Street, Springfield, IL 62761.
- State of Illinois. 1971. Inventory of Illinois Drainage and Levee Districts. Department of Business and Economic Development, State of Illinois, Springfield.
- Sullivan, Thomas F. P., ed. 1995. Environmental Law Handbook. Government Institutes, Inc. Rockville, MD.
- [SWCD] Illinois Soil and Water Conservation Districts Act. Ill. Compiled Statutes, Ch. 70, Par. 405/1 et seq. Illinois Department of Agriculture Bureau of Soil and Water Conservation, P. O. Box 19281, State Fairgrounds, Springfield, IL 62794-9281.
- Tazewell County, Illinois, Erosion, Sediment and Stormwater Control Ordinance. Section 7-7-1 et seq. Approved March 27, 1996.

Section IV

Mackinaw River Watershed Action Plan

Introduction

The Mackinaw River Project Planning Team worked with experts and Action Teams for a year to pursue their initial purpose - to form the Mackinaw River Watershed Management Plan, with agreed upon strategies, leading to achievable goals, to be met by specific recommendations. They agreed to work first toward correction of the problems that the Planning Team believed were most important to improve water quality, based on information presented in the previous sections.

Mission of the Project

The Project Planning Team Purpose and Function Statement reads:

"We intend to preserve and enhance the natural resources of the Mackinaw River watershed through education, good management practices and voluntary cooperation while respecting property owner rights. We believe that:

- People can make the world a better place.
- ♦ Cooperation and compromise are essential to achieve common goals.
- Integrity is essential to all good relationships.
- ♦ Knowledge is power.
- When we treat others with consideration we promote good will.
- Private property rights are essential for freedom.
- Conserving our resources now is essential for future generations.
- Each person is accountable for his/her actions.

- Agriculture is essential to the economic activity of this country.
- The benefits of change must be understood to be accepted.
- Landowners are responsible for their land.
- ♦ The decisions used to guide an area are better and more informed when they come through consensus of the people who live in that area.
- ♦ And we believe that voluntary action is essential to the success of the Mackinaw River Project."

Fundamental values formed the framework for their mission. This description of the mission is quoted from Robert Reber's "The Mackinaw" (*The Illinois Steward*, offprint, December 1996, 8 p.).

- What is good for the river is good for its people. Humans are dependent on healthy, functioning ecosystems. Land health and human health are inextricably linked.
- ◆ To find the common good, a holistic approach is needed that considers all aspects of the watershed--the land, its people, and their lives. People themselves have to help form the plan, carry it out, and benefit from it.
- The views and values of the citizens must be considered and incorporated into the plan.
- ♦ If the citizenry is aware of issues of broad importance and given sound information to act on, they will voluntarily do what is best for the common good: the long-term benefit of society.
- Given the opportunity, nature heals itself when original problems are corrected. Preservation and restoration efforts should allow nature to take the lead; humans can assist but should not attempt to overpower nature.

(Reber, 1996, page 6)

Objectives

The Planning Team agreed to adopt recommendations that would meet these objectives:

- A percentage reduction in water volume, velocity and frequency of extreme flood events over a given period of time under normal or average weather conditions
- ♦ Observable, measurable reduction in bank erosion and an increase in amount (length and width) of streambank protection/vegetation
- ♦ An increase in the average Index of Biological Integrity including other aquatic species
- Reduced sediment loads
- ◆ Perceived reduction in soil erosion
- Reduction of untreated sewage.

Parameters

The recommendations must operate within these agreed upon parameters:

- ◆ No aspect of this project will undermine the property rights of landowners.
- We will address both symptomatic and systemic issues.
- We will evaluate long-term as well as short-term consequences and costs of each recommendation.

Strategies

The Planning Team agreed to six strategies to reach these objectives:

- 1. Coordinate with agencies in order to eliminate our duplicating their efforts.
- 2. Promote agricultural practices to limit flooding, run-off, pollution, top soil loss and streambank erosion.

- 3. Improve the diversity of natural plant, aquatic and animal communities within the watershed.
- 4. Enhance participation of local communities/developers/civic/business leaders in programs to control runoff, bank erosion, pollution and soil loss.
- 5. Educate rural and urban landowners, civic and business leaders and children about the project.
- 6. Clarify laws and issues regarding private property rights.

Recommendations of the Planning Team

On February 22-23, 1997, the Mackinaw River Project Planning Team adopted fifteen major recommendations from six Action Teams and established goals to be achieved within 5, 10 and 15 years. The Planning Team will reconvene and evaluate the goals and recommendations, make adjustments and move forward again.

Goals were selected because the Planning Team believed they concur with the goals established at the initiation of the Mackinaw River Project and the assessment of watershed needs (Section II, Resource Inventory). The following sections present specific recommendations, goals to be met within a specified time, and costs and benefits of each recommendation. Gaps not addressed by the Action Teams were identified and committees formed to research potential solutions. Solutions to identified gaps will be considered at the annual reevaluation meeting.

Recommendations are categorized by the strategies they follow in order to meet the objectives of the Planning Team. Several recommendations meet both agricultural and biological diversity objectives. Wetland restoration, streambank stabilization and woodland establishment reduce negative impacts of agricultural practices on water quality as well as improve habitat for enhanced biological diversity. As a result these recommendations are presented separately from recommendations that are uniquely agricultural strategies.

Agriculture

Strategy

Promote agricultural practices to limit flooding, runoff, pollution, top soil loss and streambank erosion.

Recommendations

Recommendation #1:

Encourage the acceptance of agricultural practices outlined in the booklet "Conservation Choices" published by the USDA Soil Conservation Services, in order to meet the following goals:

Best Management Practice	Goal after 5 years	Goal after 10 years	Goal after 15 years
Crop Residue Management			
1-year no-till	42,000 acres	52,000 acres	62,000 acres
2-year no-till	7,500 acres	9,500 acres	11,500 acres
Critical Areas Planting/ CRP	25%	40%	60%
(% eligible acres)			
Water & Sediment Control Basins	4,200	5,200	6,200
(# of structures)			
Grassed Waterways (acres)	300 acres	400 acres	500 acres
Filter Strips (Total miles = 11,500°)	300 miles	400 miles	500 miles
Farm Ponds to Retain Stormwater (number)	300	400	500
Terraces (acres treated)	42,000 acres	52,000 acres	62,000 acres
	2.10		
Grade Control Structures (number)	240	300	360
	0.000		
Management Intensive Grazing (acres treated)	9,600 acres	11,600 acres	13,600 acres
	260	450	7.40
Contour Farming (acres treated)	360 acres	450 acres	540 acres
Mariana Mariana (0/ anadana)	5007	700/	000/
Nutrient Management (% cropland)	50%	70%	90%
D ::: 1.14	500/	700 /	0.007
Pesticide Management (% cropland)	50%	70%	90%

Benefits

Meeting these stated goals will bring into recommended conservation practices 60 percent of the estimated treatment needs of the Mackinaw River watershed, as determined by USDA NRCS "Mackinaw River Basin Inventory and Evaluation of Erosion and Sedimentation and an Assessment of the Conservation Treatment Needs," prepared for The Mackinaw River Project and The Nature Conservancy, January 1997.

<u>Cost</u>

Practice	Cost /acre	Cost after 5 years	Cost after 10 years	Cost after 15 years
Crop Residue Management				
I-year no-till	\$10/Acre	\$420,000	\$500,000	\$620,000
2-year no-till	\$10/Acre	\$ 75,000	\$ 95,000	\$115,000
Total		\$495,000	\$595,000	\$735,000
Critical Area Planting	\$100/acre	\$170,000	\$275,000	\$410,000
100% = 6788 A.				
Water & Sediment Control	\$1500/	\$6.3 million	\$7.8 million	\$9.3 million
Basin	installation, ave.			
Grassed Waterways	\$1000/acre	\$300,000	\$400,000	\$500,000
100% = 1990 A.				
Filter Strips	\$960/ mile; or	\$78,000	\$104,000	\$3 million
100%=102 mi	\$120/acre			
66 ft. wide				
Farm Ponds	Variable Cost not available at time of prin		at time of printing	
Terrace	Variable	Cost not available at time of printing		
Grade Control Structure	\$4000	\$960,000	\$1.2 million	\$1.5 million
Management Intensive				\$0 -\$17,000/acre
Grazing				ncing \$2-\$20/foot
				ing \$20-\$80 / acre
				on \$20-\$100 / acre
				\$0 - \$5000 / site
		1 otal c	ost not available	at time of printing
C. t. F			-	VT
Contour Farming	No additional cost			
	i i			
Nutrient Management	Variables \$0.50 to Cost not exclible at the cost of th			at time of mintine
Nutrient Management	Variable: \$0.50 to \$10 per acre	1 2		
	aro per acre			
Total estimated costs				
available at time				
of printing		\$8,393,000	\$10,374,000	\$15,445,000

Agriculture

Recommendations

Recommendation #2:

Secure additional staff members as needed to carry out the recommendations of these action plans.

Benefits

Most agricultural conservation practices require agency personnel to distribute information about government programs available for enrollment, hold public informational meetings, spend time with individual landowners completing the necessary applications in order to qualify. Significantly greater efforts than can be met with current staff are anticipated to meet the identified goals.

Cost

Cost of additional staff

Additional 20% of project costs

Agriculture and Biological Diversity

Strategy (Agriculture)

Promote agricultural practices to limit flooding, runoff, pollution, top soil loss and streambank erosion.

Strategy (Biological Diversity)

To improve the diversity of natural plant, aquatic and animal communities within the watershed.

Joint Recommendations

Practice	Goal after 5 years	Goal after 10 years	Goal after 15 years	
Streambank Stabilization	60 miles	75 miles	90 miles	
Wetland Establishment or Enhancement	7,500 acres	15,000 acres	22,500 acres	
Woodland Management	10,000 acres	12,500 acres	15,000 acres	
Forest and Prairie Planting			15,000 acres	

Recommendation #1:

Stabilize streambanks; encourage use of natural materials and native vegetation; establish grass buffers along drainage ditches and other waterways where needed with an emphasis on tributary locations which are most effective.

- A. Identify stream mileage within the Mackinaw River basin that has potential for streambank stabilization, riparian corridor or filter strip development.
- **B.** Provide information to landowners and incentives for participation.

- C. Work toward implementation of legislation to allow an annual state income tax credit for row crop land converted to permanent vegetative cover, through a private land wildlife habitat plan.
- **D.** Promote streambank stabilization, riparian corridors and grass filter strips to landowners within the Mackinaw River watershed.

Benefits

Protection of stream corridors will provide acres for wildlife habitat, reduce streambank erosion, reduce soil erosion, improve water quality and aquatic habitats, and reduce sediment loads downstream in the Illinois and Mississippi River systems.

Cost

Streambank Stabilization (\$20/linear foot times miles)

After 5 years After 10 years After 15 years	\$6.4 million \$7.9 million \$10 million
Signs and posts for landowner recognition	\$34.00/landowner
Income tax credit for riparian farmland converted to permanent cover	\$140.00/acre
Total tax credit (250 landowners, 15acres/landowner)	\$525,000.00

Agriculture and Biological Diversity

Joint Recommendations

Recommendation #2:

Identify and promote restoration of suitable wetland habitat and promote side stream storage such as slough and backwater lakes.

- A. Develop an incentive program for wetland development, including recommending legislation to allow an annual state income tax credit for rowcrop land converted to permanent vegetative cover in a private land wildlife habitat plan than includes wetlands.
- **B.** Determine status of existing wetlands, sloughs and backwater lakes and identify those which can be developed and those that pre-exist.
- **C.** Promote restoration and development of existing and potential wetlands, sloughs and backwater lake habitats.

Benefits

Improved Water Quality

Wetlands can provide natural pollution control to improve water quality, by filtering nutrients, chemicals, bacteria and sediment from surface waters. Wetlands are also effective sinks for pesticides, herbicides, and metals and can be used to treat animal wastes, urban sewage, and stormwater runoff. Wetlands slow runoff and store water, reduce soil erosion, reduce flood peaks and reduce bank erosion. Stored water replenishes groundwater supplies. Reducing flooding results in lessened bank erosion and sedimentation and improved water quality.

Enhanced Biological Diversity

Wetlands increase biological diversity by providing nesting, feeding and breeding habitat for waterfowl, amphibians, and many other types of wildlife.

More than 5,000 plant species, 190 species of amphibians, and one-third of all U.S. native bird species are supported by wetlands.

Cost

Income tax credit, lost state revenue	\$140/acre
Revenue after 5 years (7500 acres) Revenue after 10 years (15,000 acres) Revenue after 15 years (22,000 acres)	\$1.05 million \$2.1 million \$3.15 million
Signs and posts for wetland areas	\$34/landowner
Wetland Establishment, per acre	Estimated \$500
Cost after 5 years Cost after 10 years Cost after 15 years	\$3.75 million \$7.5 million \$11.25 million

Agriculture and Biological Diversity

Joint Recommendations

Recommendation #3:

Increase percent of watershed in forest, focusing on historically wooded areas, riparian zones or highly erodable lands, to meet the acreage goals delineated in this Plan. Manage existing woodlands for timber production, soil protection and natural habitat; plant additional acres with trees to expand forested area.

Benefits

Woodland management goals, including tree planting will reduce sedimentation by replacing forest vegetation on highly erodable forest soils, especially those in the lower Mackinaw River valley. Woodland management that reduces the effect of Sugar Maples and enhances healthy understory vegetation will help hold soil in place and reduce sedimentation. Greater natural vegetation will slow runoff and assist in the reduction of flood peaks and intensity.

Cost

Costs are included under Recommendation #1, Biological Diversity.

Agriculture and Biological Diversity

Joint Recommendations

Recommendation #4:

Encourage planting grasslands to native prairie species, especially on highly erodable acres, filter strips and buffer areas.

Benefits

Grass cover on filter strips, agricultural buffers and CRP acres reduces soil erosion, enhances soil quality and provides wildlife cover. Native grassland would provide habitat for native species, enhancing biodiversity, while simultaneously meeting the needs of soil protection.

<u>Cost</u>

Costs are included in Recommendation #1, Biological Diversity.

Summary of Costs for Joint Recommendations of Agriculture and Biological Diversity Action Teams

Practice	Cost / unit	Cost after 5 years	Cost after 10 years	Cost after 15 years
Streambank Stabilization	\$20/linear ft.	\$6.4 million	\$7.9 million	\$10 million
Wetland Establishment	\$500/acre	\$3.75 million	\$7.5 million	\$11.25 million
Woodland Management	Variable	Cost not available at time of printing		
Prairie and Forest Planting	\$500/acre	\$7.5 millio		\$7.5 million
Total estimated cost available at time of printing		\$10.35 million	\$15.4 million	\$28.75 million

Impacts of Planned Conservation Practices on Nonpoint Source Pollution - Mackinaw River Basin (March 1997)

Source: USDA Natural Resources Conservation Service

Conservation Practice	Resource Concerns			
	Sediment	Nutrient Management	Agricultural Waste	Pesticide Use
Crop Residue Management: 1-yr no-till	SIG	MOD	SL	MOD
Crop Residue Management: 2-yr no-till	SIG	MOD	SL	MOD
Critical Area Planting or CRP	SIG	SIG	SIG	MOD
Water and Sediment Control Basins	SIG	SL	SL	SIG
Grass Waterway	SIG	MOD	SL	MOD
Filter Strip	SIG	MOD	SL	MOD
Streambank Stabilization	SIG	SL	SL	SL
Pond	N	N	N	SL
Terrace	SIG	SIG	SL	SIG
Grade Control Structure	SIG	N	SL	N
Management Intensive Grazing	SL	MOD	SIG	SL
Contour Farming	MOD	MOD	SL	SIG
Nutrient Management	N	SIG	SIG	SL
Pesticide Management	SL	N	N	SIG
Wetland Establishment or Enhancement	SIG	SIG	SIG	SIG
Tree Planting	SIG	MOD	SL	MOD
Woodland Management	SIG	SL	SL	SL

Legend: SIG = Significant positive impact; MOD = Moderate positive impact:

SL = Sight positive impact; N = Negligible impact.

Biological Diversity

<u>Strategy</u>

To improve the diversity of natural plant, aquatic and animal communities within the watershed.

Recommendations

Recommendation #1:

Identify and enhance or restore natural plant areas compatible with soil type and historical use. Establish, restore or widen riparian zones where desirable.

- A. Within two years, identify at least one location of each natural community type known to occur in the watershed where the natural community can be enhanced or restored. For natural communities that were previously known in the watershed but no exiting examples are known, identify suitable locations where the natural community can be recreated.
- **B.** Establish a green corridor linking protected natural lands. High priority should be given to connecting protected natural lands.
- C. Restore and/or protect large forests (>100 acres) where feasible.
- D. Support private restoration efforts on ParkLands Foundation lands.
- E. Protect and restore high-quality natural areas recognized by the Illinois Natural Areas Inventory where feasible. The committee will secure the locations of these areas and identify the practices needed and funds required.
- **F.** Enhance landowner awareness of wildlife and habitat improvement programs including Acres for Wildlife, streambank stabilization programs, wetland reserve program, and the C2000 Ecosystem partnership. This goal should be substantially completed within 5 years, largely through efforts of the Education Action Team.

Benefits

Improved natural diversity of plant and animal species will enhance the quality of life for residents and visitors to the Mackinaw River watershed. Conversion of sensitive land to natural cover will reduce erosion and sedimentation by increasing infiltration and reducing runoff. Protective natural land cover will reduce streambank and scour erosion. Natural vegetative cover will improve water quality and improve habitat conditions for both aquatic and upland native species. Increased quantity and quality of wildlife habitat in the river watershed and central Illinois region will result from restoration and improved management of wetland, woodland and natural prairie areas. Economic returns (retail sales) will increase from hunting, fishing and other recreational uses because of improved wildlife habitat and overall ecological conditions. Farmers in other counties have benefited from leasing hunting rights to outside groups or individuals. Economic returns to farmers may increase through higher grain prices if 29,000 acres of sensitive land are converted from cropland to other uses.

Cost

Technical assistance to identify natural community types

\$10,000

Land acquisition or easement costs

Undetermined

Voluntary or no cost participation is anticipated on most sites. Easement attainment on special needs basis.

Restoration of natural plant and animal communities

\$300 - \$500 / acre

Total restoration costs

\$8.7 million - \$14.5 million

Establish or restore one large scale landscape (600-1000 acres)

\$2 million

Total acquisition and restoration costs

\$8,720,000 - \$14,520,000

Biological Diversity

Recommendations

Recommendation #2:

Seek public and private funding for stream restoration and biological restoration.

Benefits

Obtaining funding is essential to achieve identified goals of improving biodiversity through restoration of habitat. Many benefits of an improved watershed environment accrue to the general public, beyond the residents of the watershed.

Cost

No cost available at time of printing.

Biological Diversity

Recommendations

Recommendation #3:

Recognize landowners, local governmental units, agencies, etc. (plaque, marker, certificate of appreciation) using good land management practices (e.g. leaving wooded riparian zones along a corridor).

- **A.** Within one year have in place a program to recognize landowners for good management practices, with a custom certificate for their home or office and/or signs on property.
- **B.** Within one year, develop criteria for signs and certificates.
- C. Within one year, identify landowners eligible for recognition, who have protected wooded riparian zones, planted trees or native grasses, created wetlands, stabilized streambanks, etc.
- **D.** Simultaneously with recognition programs, work with local schools to have their students from this community present the award to the landowner.

Benefits

Give landowners the recognition they deserve. Visible signs make the public aware of the project, and may bring other landowners into the programs.

Cost

Signs and posts (300 landowners)

\$34.00/landowner

Total costs of recognition

\$10,200

Community Issues

<u>Strategy</u>

Enhance participation of local communities, developers, and civic and business leaders in programs to control runoff, bank erosion, pollution and soil loss.

Recommendations

Recommendation #1:

Control stormwater runoff and erosion.

- A. Within fifteen years, contact communities to encourage communities to adopt Best Management Practices as identified in the publication, Illinois EPA's "Urban Best Management Practices."
- **B.** Within fifteen years, conduct site investigations and engineering studies to identify and prioritize stormwater runoff and erosion control projects for communities interested in adopting urban best management practices.
- C. Within fifteen years, construct urban stormwater runoff and erosion control demonstration projects/models.
- **D.** Within fifteen years, find a good example and encourage adoption of a model ordinance for stormwater runoff in urban and developing areas.
- **E.** Within fifteen years, secure a staff person to contact and assist communities to reduce stormwater runoff through implementation of a stormwater ordinance and/or implementation of urban best management practices.
- **F.** Within fifteen years assist communities in efforts to initiate erosion control on 60 percent of urban acres.

Benefits

Approximately 30,400 acres of the watershed is in small and large urban areas. Urban development and the increased use of impervious materials in all communities add to the stormwater runoff and erosion problems in the river watershed, especially to the peak flow of water. Stormwater management in these areas has the potential to greatly reduce peak flows, greater than the less than 5 percent of the watershed that is urbanized. A demonstration of best management practices provides an effective educational tool to persuade similar communities to plan for stormwater runoff from future developments. Demonstration projects that are developed now will help people in the future make wiser decisions.

Cost

These preliminary estimates of costs will be further refined during the first year of implementation of the Plan.

Engineering and site investigations to identify and prioritize projects for interested communities \$200,000

Construction of demonstration stormwater control projects/models for interested communities

\$600,000

Community Issues

Recommendations

Recommendation #2:

Improve wastewater disposal within the Mackinaw River Watershed.

- **A.** Within fifteen years work with Illinois EPA Bureau of Water to establish specific guidelines for design, construction, maintenance, and operation of constructed wetland wastewater treatment facilities.
- **B.** Within fifteen years provide for technical assistance for participating communities to study wastewater problems and alternative solutions.
- C. Within fifteen years work with participating communities to construct alternative wastewater disposal solutions including, but not limited to, wetlands and demonstration wastewater treatment sites.
- **D.** Within fifteen years work with schools, colleges, universities, trade associations, etc. to develop educational components on best management practice demonstration sites.

Benefits

Excessive nutrients and sediment contribute to reduced water quality on some portions of the Mackinaw River and its tributaries that are ranked by Illinois EPA as "Fair, Minor Impaired, and Moderate Impaired" in water quality. Illinois EPA identified municipal point source pollution as a contributing source of pollution. (See Part II, Watershed Inventory -- Water Quality) A demonstration wastewater control facility suitable for a small community will educate people and permit future decision-makers to make wiser choices.

Cost

Engineering and site investigation, technical assistance for participating communities to study wastewater problems and alternative solutions.

\$200,000

Construction of alternative solutions, including demonstration \$400,000 wetlands and wastewater treatment sites for participating communities.

Community Issues

Recommendations

Recommendation #3:

Reduction of roadway-easement area stormwater runoff.

- A. Within fifteen years study and coordinate with township, county, and state highway departments for implementation of policies and alternative solutions for runoff reduction.
- **B.** Within fifteen years engineer and construct best management practice demonstration sites.

Benefits

The impervious surfaces of roadways cause stormwater runoff to be accelerated onto nearby land. Many township and county roads, as well as state and interstate highways, cross the Mackinaw River and its tributaries, permitting stormwater runoff to flow directly into the river. In addition, roadside ditches often contribute to sediment loads carried by stormwater to the river. De-icing chemicals used on roadways contribute pollutants to the waterways. Chemical spills resulting from accidents have the potential to pollute nearby streams. Alternative stormwater runoff management systems may reduce highway impact on the river system. In addition, roadsides provide opportunities for planting natural vegetation that provide habitat corridors for native species and diversify the landscape.

<u>Cost</u>

Engineering and site evaluation

\$100,000

Construction of BMP demonstration sites

\$200,000

Education

<u>Strategy</u>

Educate rural and urban landowners, civic and business leaders and children about the Mackinaw River Project.

Recommendations

Recommendation #1:

Develop a network of educational activities through which information about the Mackinaw River watershed and the Mackinaw River Project can be disseminated.

- A. Within five years conduct a feasibility study to initiate the process of planning and designing a multi-purpose experiential Education /Conference Center that will be operated and funded as a private foundation. Coordinate this effort with organizations such as USDA/NRCS and the Illinois River Project.
- **B.** Within one year organize and facilitate the first annual Mackinaw River Festival that will celebrate the beauty and uniqueness of the river system. The festival will include music, unique arts and crafts, various displays (historical, environmental, agricultural, etc.).
- C. Within one year develop and coordinate the first annual Mackinaw River Conference to provide a functional understanding of the Mackinaw River watershed and the goals of the Mackinaw River Project.
- D. Within five years coordinate existing workshops and develop new workshops pertinent to the Mackinaw River Project and the care and management of river system conservation throughout the Mackinaw River watershed.

Benefits

All these recommendations facilitate educating interested citizens and landowners, agencies, environmental organizations, agricultural organizations, youth organizations and educational institutions about implementing the recommendations of the Mackinaw River Project. Public events disseminate information about agricultural BMP's and available programs. A Conference

Center provides a focal site to develop demonstration plots for agricultural BMP's and native plants, to demonstrate improved biological diversity and to increase participation of local municipalities. Classes, conferences and other educational efforts will educate rural and urban landowners and residents. After the first year, the Festival has the potential to make a profit, which could support other educational projects in the watershed.

Cost

Feasibility study to plan a Conference Center	\$2,000
First Mackinaw River Festival (first year only)	\$10,000
Mackinaw River Conference	\$5,513
Coordinate workshops	\$2,468
Lesson Plans	<u>\$4,895</u>
Total	\$24,876

Education

Recommendations

Recommendation #2:

Within five years organize and train six citizen habitat-monitoring / stewardship teams that will collect valuable biological, chemical and hydrological data at six locations throughout the Mackinaw River watershed over a period of two years.

Benefits

These teams will increase public awareness about nonpoint source pollution and its effect on the Mackinaw River system through public presentations, community displays of their monitoring/stewardship efforts and community awareness activities. These teams will also be involved in the implementation of best management practices and monitoring the effects these projects have on water quality in the Mackinaw River system.

Cost

Six citizen-monitoring teams

\$33,210

Education

Recommendations

Recommendation #3:

Within five years develop environmental lesson plans specific to the Mackinaw River watershed.

- A. On an ongoing basis, expose young people to science as a profession and to the science operating within the Mackinaw River watershed.
- **B.** Within five years develop a Mackinaw River lab manual, an educational tool for grades K through 12 to be written and used by educators. This manual will contain experiential, investigative learning exercises specific to the Mackinaw River watershed for all age groups, to be published and distributed to interested educators.

Benefits

Educational activities in the schools should spread information about the Mackinaw River Project Watershed Management Plan and the watershed to families of school children, also.

Cost

Mackinaw River Lab Manual

Cost included in workshop

Agency Coordination

<u>Strategy</u>

Enhance participation of local communities, developers, and civic and business leaders in programs to control runoff, streambank erosion, pollution, and soil loss.

Recommendations

Recommendation #1:

Make "Landowners Guide to Natural Resource Management Incentives" available to individual landowners/operators within the Mackinaw River watershed.

Benefits

Landowners' knowledge of available agricultural and conservation programs will encourage the participation necessary to meet Watershed Management Plan goals.

Cost

Print and mail "Landowners Guide...."

\$5,000

Agency Coordination

Recommendations

Recommendation #2:

Seek, recognize, encourage, and support efforts which diversify agency participation in achieving the overall goals of the Mackinaw River Watershed Management Plan.

Benefits

Goals will most effectively be met by the participation of all available agencies and programs. It is important to avoid duplication of effort and to make the available programs easily understood by interested citizens. Landowners will be more likely to select best management practices that improve water quality if enrollment in programs is easy. If a landowner can learn about and choose a suitable program from a single office it will simplify enrollment and improve participation. Cooperation between landowners who will apply best management practices and Agencies that supply technical and financial assistance will promote maximum progress toward achieving the goals of the Mackinaw River Project.

Cost

Cost not available at time of printing.

Agency Coordination

Recommendations

Recommendation #3:

Adopt an organizational structure for Implementation of the Mackinaw River Watershed Management Plan.

Benefits

The Mackinaw River Project Planning Team agreed that a permanent organization structure will be necessary to meet watershed goals over the years, in order to sustain citizen interest and efforts.

<u>Cost</u>

Cost not available at time of printing.

Mackinaw River Watershed Implementation Cost Summary

Objective	Total Estimated Cost after 15 years
Agriculture	
Recommendation #1	\$15,445,000
Recommendation #2	\$3,089,000
Agriculture and Biodiversity	
Recommendation #1	\$10,533,500
Recommendation #2	\$14,408,500
Recommendation #3	Cost included under Recommendation #1,
Recommendation #4	Biological Diversity Cost included under Recommendation #1, Biological Diversity
Biological Diversity	Diological Divolotty
Recommendation #1	\$14,520,000
Recommendation #2	No cost available at time of printing
Recommendation #3	\$10,200
Community Issues	
Recommendation #1	\$800,000
Recommendation #2	\$600,000
Recommendation #3	\$300,000
Education	
Recommendation #1	\$24,876
Recommendation #2	\$33,210
Recommendation #3	Cost included in workshop
Agency Coordination	
Recommendation #1	\$5,000
Recommendation #2	Cost not available at time of printing
Recommendation #3	Cost not available at time of printing
Total Estimated Cost for Implementation	\$59,769,286

Gaps

Two committees were formed to address several gaps in the first Mackinaw River Watershed Management Plan that the Planning Team identified. Gaps will be reconsidered for recommendation when the Action Plan is periodically re-evaluated. One committee will investigate issues related to livestock waste management, timberland zoning and development, access and property rights, and river cleanup. Committee members agreed that significant progress occurred in the one and one-half year existence of the Mackinaw River Project Planning Team and recognized that a continuing effort is necessary to assess problems and recommend solutions to reach long-term goals identified in this document. A committee was assigned to research and present proposals in January 1998 to form a long-term structure for the Mackinaw River Project.

Gaps in the recommendations that were identified by the Planning Team usually resulted from inadequate time to investigate background and solutions properly. Livestock waste management rules are currently the focus of Illinois Pollution Control Board rule-making procedures (see Part III. Existing Watershed Programs -- Agencies and Laws, this document). The committee believed better recommendations may be made after the state rules are adopted. Conflicting land uses were not directly addressed by any recommendations presented in this document. Residential development on timberland along the Mackinaw River acutely conflicts with maintaining and expanding biodiversity. County zoning, especially McLean County, designates timber ground for residential development. As a result, fragmentation and loss of forest habitat occur. In addition, individual homeowners escape requirements to control stormwater runoff. The Gaps committee also received an assignment to continue developing a proposal for stream cleanup concentrating on bridge sites and visible locations. Issues of access to the river for canoeing and the maintenance of private property rights were not possible to resolve in the time available. Monitoring issues of access and property rights was assigned to the Gaps committee, also.

Implementation

All recommendations can be independently implemented in any order. Implementation requires major funding from granting agencies, such as Illinois Environmental Protection Agency and Illinois Department of Agriculture. The Nature Conservancy will continue to be the guiding entity for an additional year. In addition, because most of the recommendations involve enrollment of individual landowners in conservation programs, one additional staff person will be necessary for the Soil and Water Conservation District in each of the three major counties, McLean, Woodford and Tazewell, to handle the anticipated increased work load.

Other Proposals

Several recommendations from Action Teams were not adopted by the Planning Team. Some were good ideas that were not developed by the Action Teams because of lack of time and interested workers. Others were not adopted because, although they might be good ideas, the Planning Team concluded the ideas were not effective in meeting the primary goals of the Project, or the needs were being met by existing programs in the state.

These ideas might be of interest to residents of other watersheds, or to Mackinaw River watershed residents in the future.

1. Storm Sewer Awareness Action Plan, accomplished by stenciling city storm drains. The objective is to inform citizens that sewers drain into a particular body of water, and discourage dumping of oil and debris in storm sewers. Although this program has been effective in other cities, the committee wished to concentrate on recommendations that targeted reduction in runoff and sedimentation to the river. This activity was referred to the Education Committee to consider for a workshop.

- 2. Home*A*Syst Educational Program to educate and promote better practices regarding household hazardous waste, solid waste, homeowner use of pesticides and fertilizer, and private sewage disposal.
- 3. Used Oil Collection Events.
- 4. Used Tire and Household Hazardous Waste Collections.
- 5. Paint Exchange.

Conclusions

The recommendations proposed in this document were selected by the Mackinaw River Project Planning Team to reduce stormwater runoff and sedimentation to the river, reduce peak flow water levels in the river, protect and stabilize streambanks, reduce untreated sewage and increase biodiversity in the watershed. Many people spent much time developing these recommendations. The watershed residents who served on the committees freely contributed their time for the benefit of long-term quality of life in the Mackinaw River watershed. Implementation of the recommendations will require a long-term commitment, requiring many years to reach the goals identified in this document. In order to benefit from experience gained in the first years of implementation, goals should be reevaluated annually. Residents of the watershed can take pride in looking to a stable diverse environment that can persist for an unlimited future. To become involved in the project contact The Nature Conservancy, Illinois Field Office, 1201 S. Main, Eureka, Illinois 61530, Phone (309)673-6689. Please protect and enjoy the river and its' watershed!

References

- Reber, Robert. 1996. "The Mackinaw." The Illinois Steward, offprint, December 1996, 8 p.
- State of Illinois. 1997. Landowners Guide to Natural Resources Management Incentives. Illinois Natural Resources Coordinating Council.
- Suloway, Liane and Marvin Hubbell. 1994. "Wetland Resources of Illinois, An Analysis and Atlas," Illinois Natural History Survey Special Publication 15, July 1994.
- USDA. 1993. Conservation Choices. U.S. Department of Agriculture Soil Conservation Service, Champaign, IL U.S. Government Printing Office: 1993-546-416.
- [NRCS] Natural Resources Conservation Services. 1997. Mackinaw River Basin Inventory and Evaluation of Erosion and Sedimentation and an Assessment of the Conservation Treatment Needs. USDA Natural Resource Conservation Service. 1902 Fox Drive, Champaign, IL 61820.

Appendix B

List of Resources



Yourse (CCC

LIST OF RESOURCES

Components of Watershed Management Plan	Information / Technical Assistance	Education	Funding Assistance/Cost Share.Programs
Watershed Description	NRCS, SWCDs, IEPA, INHS, ISWS, ISGS, INHS, USGS	CTIC	
Watershed Activities	IEPA, SWCD's, NRCS, USEPA, Other	USEPA, NRCS, SWCD's, IEPA, Local Univs.	
Waterbodies / Water Quality	IEPA, ISWS, ISGS, Cty. Health Dept., USEPA, IDOA, CES NRCS, SWCDs, Publ. Water Supl.	IEPA, Cty. Health Dept., SWCDs, USEPA	
Groundwater	IEPA, ISWS, ISGS	Cty. Health Dept., USEPA, IEPA, SWCD's	
Irrigation	ISWS		
Drainage	Local Drain. Distr.,		
Floodplain Boundaries	SWCD, USACE		
Municipal / Industrial	IEPA, USEPA		USEPA, IEPA
Riparian Corridors / Streambank Stabilization	SWCD's, ISWS, IDNR, NRCS	SWCD's, NRCS, IDOA	NRCS, IDNR, IEPA, IDOA
Hydrologic Modifications	Local Drain. Distr., USACE, NRCS, SWCD's, IEPA		NRCS, USACE, IDOA, IEPA

Table Key

Reg. Planning Grps. - Regional Planning Groups
Stormwater Comm. - Stormwater Management Commissions
SWCD - Soil and Water Conservation Districts Local Land Trust Orgs. - Local Land Trust Organizations USEPA - United States Environmental Protection Agency Local Schls. & Univs. - Local Schools and Universities Cty. Planning Comm. - County Planning Commission Other - Zoos, Museums, Environmental Organizations CTIC - Conservation Technology Information Center *ISGS - Illinois State Geological Survey *INHS - Illinois Natural History Survey **USACE** - United States Army Corps of Engineers IEPA - Illinois Environmental Protection Agency IDNR - Illinois Department of Natural Resources USDA - United States Department of Agriculture NRCS - Natural Resource Conservation Service Cty. Health Dept. - County Health Department Local Drain. Distr. - Local Drainage Districts *ISWS - Illinois State Water Survey Publ. Water Supl. - Public Water Supplies IDOA - Illinois Department of Agriculture USF&W - United States Fish and Wildlife IPCB - Illinois Pollution Control Board CES - Cooperative Extension Service Twp. Boards - Township Boards TNC - The Nature Conservancy Cty. Boards - County Boards

*Entities within Illinois Department Natural Resources

Please Note: Although this list is not all-inclusive it will provide information that you will need to begin the watershed management planning process.

Other potential resources may include: scouting troops, church and civic organizations, local businesses and libraries, historical societies, public utilities, and county farm bureaus.

Group facilitation may also be available through IEPA, IDNR, NRCS, and other sources.



had been been been been been been been

÷.,

	100 May 100 Ma		
Components of Watershed Management Plan	Information/ Technical Assistance	Education	Funding Assistance/Cost Share Programs
Stormwater Management	IEPA, Cty. Boards, Reg. Planning Grps., Stormwater Comm.	IEPA	USACE
Wetlands	USDA, NRCS, IDNR, IEPA, USACE, USEPA	USEPA	USDA, NRCS, USF&W, IEPA
Aquatic Species	IEPA, INHS, IDNR, Other	INHS, IDNR, Other	IDNR (Habitat), Other
Priority Waterbodies	IEPA, NRCS, IDOA, USDA, IDNR	NRCS, IEPA, SWCD's	NRCS, USDA, SWCD's
Soils	NRCS, SWCDs, USGS, ISWS, IDOA	NRCS	NRCS, IDOA, Cty. Boards
Geology	ISGS	Other	
Topography	NRCS, SWCD's, USGS		
Land Use	CES, ISWS, USGS, NRCS, SWCDs, IEPA, IDNR	CES	
Air Quality	IEPA, USEPA	IEPA	
Wildlife	IDNR	IDNR	IDNR (Habitat)
Socio-Economic / Human Resources	Cty. Planning Comm., U.S. Census, CES	CES	

Table Key

Cty. Boards - County Boards

Cty. Health Dept. - County Health Department

Cty. Planning Comm. - County Planning Commission

CES - Cooperative Extension Service

CTIC - Conservation Technology Information Center

IDOA - Illinois Department of Agriculture IDNR - Illinois Department of Natural Resources

*ISWS - Illinois State Water Survey

*ISGS - Illinois State Geological Survey

*INHS - Illinois Natural History Survey IEPA - Illinois Environmental Protection Agency

IPCB - Illinois Pollution Control Board

Local Drain. Distr. - Local Drainage Districts

Local Land Trust Orgs. - Local Land Trust Organizations

Local Schls. & Univs. - Local Schools and Universities

NRCS - Natural Resource Conservation Service

Other - Zoos, Museums, Environmental Organizations

Publ. Water Supl. - Public Water Supplies

Stormwater Comm. - Stormwater Management Commissions Reg. Planning Grps. - Regional Planning Groups

SWCD - Soil and Water Conservation Districts

TNC - The Nature Conservancy

Twp. Boards - Township Boards

USACE - United States Army Corps of Engineers

USDA - United States Department of Agriculture USEPA - United States Environmental Protection Agency

USF&W - United States Fish and Wildlife

*Entities within Illinois Department Natural Resources

Please Note: Although this list is not all-inclusive it will provide information that you will need to begin the watershed management planning process.

Other potential resources may include: scouting troops, church and civic organizations, local businesses and libraries, historical societies, public utilities, and county farm bureaus.

Group facilitation may also be available through IEPA, IDNR, NRCS, and other sources.

We all live downstream...

"The relationship between the land and the river is symbiotic... Eliminate the habitats for the sake of food production, and water volume increases. Increase the volume and you risk more habitat. There has to be a way to produce food and protect the land, and do it all at a reasonable cost to everyone. That's what this project is all about."

Terry Giannoni, Farmer

(

"The Mackinaw River Project is an excellent opportunity for the Illinois EPA to support citizens of the watershed community in developing a local strategy to protect their water resources... Although a watershed is forever, the water quality within it is up to all of us."

Rick Mollahan, Illinois EPA

"When you give good people good information, they make great decisions."

Jim McMahon, The Nature Conservancy of Illinois







