To the Graduate Council·

I am submitting herewith a thesis written by Laura Marie Wilks-Duncan entitled "Public Participation in Watershed Planning: An Analysis of Modern Water Resources Planning Processes." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Planning, with a major in Planning.

George E. Bowen, Major Professor

We have read this thesis
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Accepted for the Council:

Associate Vice Chancellor and
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# PUBLIC PARTICIPATION IN WATERSHED PLANNING: AN ANALYSIS OF MODERN WATER RESOURCES PLANNING PROCESSES

A Thesis
Presented for the
Master of Science in Planning
Degree
The University of Tennessee, Knoxville

Laura Marie Wilks-Duncan
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# DEDICATION

This thesis is dedicated to my father,

whose memory is always an inspiration,

Robert Oscar Wilks

# ACKNOWLEDGMENTS

I owe an incredible debt of gratitude to everyone who has played a part in my academic journey, from my first inspiring science teacher in 6th grade, Mrs. Miller, to my friends, family and all my teachers. I owe many thanks to everyone that has supported, directed, and traveled with me Without these individuals my voyage would not have been imaginable, or as enriching. First, I am grateful to my committee members: Dr. Dave Feldman for his "open door," inspiring ideas, and invaluable assistance, Dr. Zanetta for her assurance and creative energy, and George Bowen for his wisdom and confidence. I would also like to acknowledge the School of Planning and Water Resources Research Center for providing me an assistantship to ease the financial burden of my journey. A special thanks goes to Dr. Dave Patterson, Nancy Loftis, Tim Gangaware, and Danielle Droitsch for their support and flexibility.

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# ABSTRACT

Watershed planning has recently emerged as a comprehensive geographically grounded method for managing environmental resources. The Tennessee Department of Environment and Conservation (TDEC) has identified the watershed approach as "ideal for addressing water resource issues, as everything is connected by water" (TDEC 1998) And, the Western Governors Council (WGC) has stated that "a watershed is a useful unit to draw in all the necessary players... it hosts the people and surrounds the variables" (WGC, 1994) In an era when planners and officials sing the praises of "sustainability" and "smart growth," watershed planning emerges as the perfect tool to bring together and balance environmental, social, and economic variables Within the framework of watershed planning, as defined by the United States Environmental Protection Agency (EPA), three vital components are identified: 1) partnerships, 2) a geographic focus, and 3) sound management techniques (USEPA 1996). It has also been hypothesized that the success of the watershed protection approach is dependent upon public involvement (EPA 1996). Recognizing the vital importance of partnerships, and the public's role in partnerships, this project investigates the effectiveness of public participation within contemporary water resources planning processes (e.g watershed protection approaches, watershed management, watershed associations and other watershed planning frameworks) These measures of effectiveness include a survey of the mechanisms for comprehensive involvement and an analysis of positive participation impacts. The results of this study identify strengths and weaknesses associated with public participation in watershed planning and make recommendations to more effectively involve the public in the planning process.

The watershed approach has great potential to be more effective than past water resource management approaches. A Watershed Approach Report Card has been developed to facilitate in evaluating and guiding a successful watershed planning process

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The Earth does not belong to man
Man belongs to the Earth.
All things are connected like the blood
which unites a family.
Man does not weave the web of life, he is only a strand in it
Whatever happens to the Earth
happens to all of us.
Whatever man does
to the web of life on Earth,
he does to himself.

-Native American belief

"Pollution is not the price we have to pay for securing industries in our midst or for building great cities. We can have factories and we can have towns and we can have clean water. Filth is the price we pay for apathy."

-Wilma Dykeman

# CHAPTER ONE

# INTRODUCTION

Historical approaches to address water resource issues have disregarded the watershed. Instead, these approaches have focused on one specific issue not taking a comprehensive approach that recognizes the connectivity of social systems and aquatic ecosystems. These top-down, single agency driven regulatory solutions, such as water supply, were divided by political boundaries rather than following nature's boundaries (Brown 1997). Over the past two decades development, increasing costs, government downsizing, legislation, and public opinion have called for a creative new approach to address water resource issues

The watershed approach has emerged as the way to answer the need for more effective, efficient, equitable, and publicly acceptable water resource management Stakeholder involvement is hypothesized as the key to a successful watershed approach (EPA CWI 1998). Ultimately, it is the public influence on policy that should guide land use decisions, and the cumulative impact of land and water use activities on water resources (Wayland III 1997).

This study sought to identify if and how public involvement effectively achieves abundantly desirable and supported results. These results may influence decision-makers and subsequent policy that affect water resources, cause a change in social and land use behaviors, and cause a variety of other outcomes to occur, as yet to be determined. Pros and cons of public participation in watershed planning have been identified, in Chapter 4.0, and recommendations to improve the effectiveness of such participation have been stated, in Chapter 5.0

## The Statement of the Problem

The Clean Water Act was enacted in 1972 to "restore and maintain the chemical, physical and biological integrity of the nation's waters" (Clean Water Act 1972). The national goal was that all U S waters should be safe for swimming and fishing by 1983 and all pollutants discharged into national waters be eliminated by 1985. Since the enactment of this legislation, much has been accomplished towards this goal One billion pounds of toxic pollutants are removed from U.S. waters each year More than 900 million tons of untreated sewage is prevented from entering our Nation's waters. And, today 66 percent of our nation's waters are safe for fishing and swimming, compared to 36 percent in 1970 (National Wildlife Federation (NWF) 1999)

Despite the progress made to improve the state of our nation's waters subsequent to the enactment of the 1972 Clean Water Act, much remains to be done to achieve national "fishable and swimable waters" as stated by the legislation. The Clean Water Act has improved water quality by identifying and regulating point sources of pollution, such as industrial discharge pipes and sewage treatment discharge pipes. However, 34 percent of the Nation's waters remain unsafe for fishing and swimming (National Wildlife Federation (NWF) 1999) This persistent problem is the result of unregulated polluted runoff such as fertilizers, pesticides, oil, grease, and animal waste.

These impaired waters often threaten public health and the environment through high bacterial or toxin levels, threaten public safety through increased flood risks, eliminate recreational opportunities such as boating, fishing and swimming, and increase the cost of water treatment for drinking water supply. These waters continue to be affected and impaired by non-point sources (NPS) of pollution. NPS pollution is pollution that does not come from one easily defined source, such as a discharge pipe. NPS pollution includes, but is not limited to agricultural runoff such as pesticides and nutrients, urban runoff such as gas and oil, and sediment runoff

from construction sites, agriculture, and forestry practices. Essentially, this type of impairment occurs as a result of how people use the land. Development of urban areas, increased impervious areas such as roads and buildings, and agricultural practices are all land uses that impact our nation's waters. This, in turn, affects people in their economic, social, and environmental dependence upon water resources. A majority of land use decisions are made individually and on local scales where people rarely make the connection of how one land use and/or the cumulative impact of varying land uses may affect the water they depend upon for drinking, stormwater control, fishing, swimming, or boating.. Watershed planning has emerged as a method to address the impacts of existing and projected land uses on local water resources.

To engage in watershed planning, a watershed must first be defined. A watershed is an area of land from which all the incoming water drains to a common destination, such as a stream, pond, lake, river, wetland, or estuary (University of Colorado 1995). Watersheds can be only a few acres in size, encompassing a few parcels of land, to thousands of acres in size, encompassing several states. Small watersheds are nested within, and comprise, larger watersheds. For example, the Pigeon River is a small watershed within the Lower French Broad River Watershed that is within the Tennessee River Watershed. An example of different scale watersheds is shown in Figure 1 (Center for Watershed Protection 1998). Simply stated, a watershed is the area of land that is drained to a stream, river, lake, etc. (Harrington and Hartwell 1999). A watershed for a creek can be part of the watershed for the river that it flows into, and that river a part of the watershed for the next Everyone lives in a watershed and it is important to recognize the cumulative human impacts upon watersheds

"Watersheds are nature's boundaries for water resources When rain falls or when snow melts, water flows downhill through rivulets, brooks, wetlands, drains, and ditches into streams, rivers, and lakes, and eventually into the ocean. Or, the water may percolate through the soil to

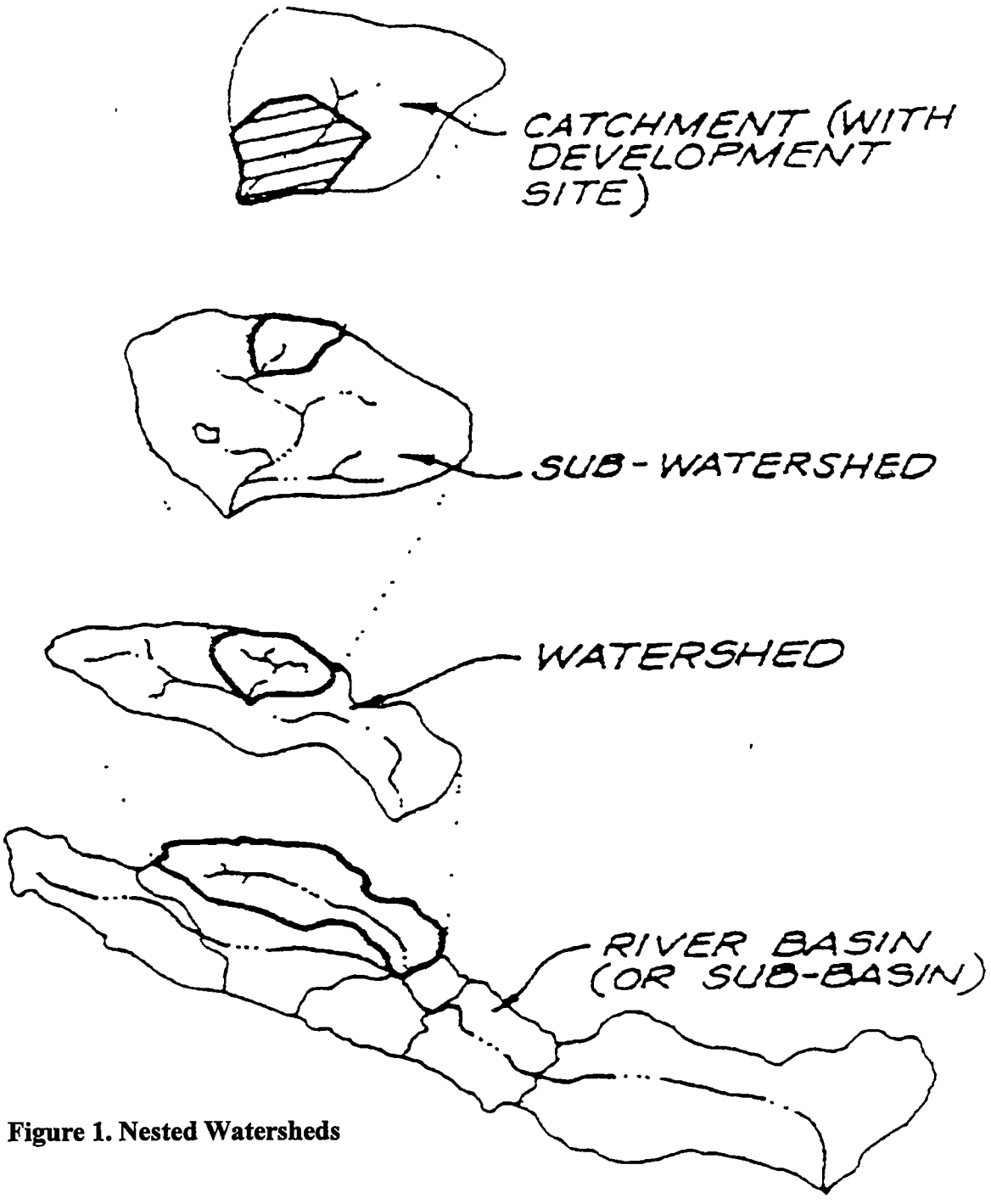


**Figure 1. Nested Watersheds**

become ground water. As it flows, water picks up pollution, sediments, and debris. As a result, physical, chemical, and biological processes, including human activities, within a watershed affect the quantity and quality of water in the collecting water body" (EPA Clean Water Action Plan (CWA) 1999)

John Wesley Powell recognized the significant natural, political, and social functions of watersheds in 1869 while surveying the western United States. He stated that "the area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of the community" (Kenney and Rieke 1997 ). Simply stated, communities should develop in close relationship with the watershed rather than be governed by arbitrary political boundaries. This belief is based upon the interconnection of social, economic, and environmental resources within this system. This was one of the first calls for watershed-based planning within the United States. Unfortunately this advice was ignored by policy-makers of the time, as the political boundaries for policy making had already been established otherwise.

## Project Purpose

The purpose of this study was to examine the effectiveness of public participation in the contemporary approaches to water resources planning at the watershed level. To achieve this, public participation in watershed planning was examined through intensive literature case studies and extensive surveys, via electronic mail, to groups currently engaged in watershed-based initiatives This thesis first examined the history of water resources management, then the evolution of public participation throughout planning processes and lastly today's method of addressing water resource issues, the watershed planning approach. Hypothesized effective and ineffective methods and mechanisms of public involvement were first analyzed through the literature review and surveys to determine the effectiveness of public participation in modern

ongoing watershed planning efforts. Finally, recommendations, including a "Watershed Approach Report Card," were made in Chapter 5 0 to most effectively involve the public in local watershed planning processes based upon the data analysis.

## Literature and Survey Studies

Intensive literature studies, analyzing literature case studies, and extensive surveys, via electronic mail, of watershed organizations currently engaged in watershed-based initiatives were utilized to facilitate answering the research questions. The survey was conducted as part of a study by the University of Tennessee Water Resources Research Center. This process is further explained in the methods section, Chapter 3.0, of this thesis.

## Primary Research Question

The question that the study ultimately sought to answer was:

Are modern methods of water resource planning more successful than the methods utilized in the past?

## Secondary Research Questions

Some auxiliary questions were first explored to aid in answering the larger question These questions and their answers are further discussed in Chapters 4.0 and 5.0.

1. How is the public defined?
2. How is public involvement defined?
3 What are the mechanisms used for public involvement?
4. What are the best methods to involve the public?
5 How do groups measure successful public participation?

6. How do groups measure failures of public participation?

7. What are the long-term (3-5 year) indicators of a successful process?

8. What are the short-term (0-3 year) indicators of a successful process?

In addition to determining the effectiveness and equity of modern water resource planning approaches, this study worked to identify the most effective mechanisms for public involvement and make recommendations to assure successful public participation and to avoid public participation failures in future water resource planning processes.

## Methodology

To explore the questions of this thesis, the research was organized in the following way:

### Understanding the Problem

A literature review was conducted to establish a baseline of knowledge that facilitated an understanding of the issues, guiding further research, and answering the research questions. The literature review explored the history of water resource management, the role of public participation in planning, and the modern watershed approach to water resources planning.

### Exemplifying the Problem

Case studies of modern watershed approaches was further studied, beyond the scope of the initial literature review. Additionally, surveys of groups engaged in watershed approaches were employed. The results from the literature and survey studies, including mechanisms of public participation and successes and failures of watershed groups, were then compiled and analyzed The result is a matrix, or "Watershed Approach Report Card," watershed-based groups may utilize to evaluate their watershed planning process Additional recommendations and

conclusions concerning public participation in modern watershed planning are made available in Chapters 4.0 and 5.0

## Value of the Study

In the words of Luna Leopold, "water is the most critical resource issue of our lifetime, and our children's lifetime. The health of our waters is the principal measure of how we live on the land" (EPA 1999).

The field of water resources is evolving to address those issues formerly neglected by historical approaches. Although watershed planning and management are not completely new concepts there is intensified and renewed interest in the watershed approach as the exemplary method to address water resource issues. "The "watershed community" has emerged as a framework for integrated decision-making with respect to water and related natural resources" (Wedel 1999). Therefore community groups, the public, are "viewed as key players in future watershed efforts" (Wedel 1999). Therefore, it is important to seek comprehensive and effective public involvement for an effective watershed approach, and to avoid the problems of past water resource management approaches

## Scope of Topic and Limitations

"Effective community-base watershed management involves a comprehensive approach that focuses on community goals and values as well as science-based information" (Wedel 1999) This study focused on the community, the public, that are vital to the success of watershed approaches. While some other important components may be mentioned, this study does not specifically explore utilization of science-based information or other parts of the watershed approach framework that are also vital to a successful watershed approach. It is important to recognize that effective public involvement is only one part of a successful approach.

## Organization of the thesis

This thesis is organized in the following manner:

Chapter 2.0 is a literature review. It looks of the history of water resource planning, public participation in planning, and the modern watershed approach to water resource planning.

Chapter 3.0 further describes the methods that were used in the literature studies and the surveys. The results from these studies were used to determine recommended methods for participation and to develop an evaluation matrix.

Chapter 4.0 lists and reviews the results from the literature studies and the surveys. A list of public participation mechanisms is found in this section.

Chapter 5.0 synthesizes the intensive literature review and survey results facilitating development of an evaluation matrix, A Watershed Approach Report Card. Recommendations on effective public involvement and discussion further accompany this matrix .

# CHAPTER TWO

# LITERATURE REVIEW

As described in Chapter 1.0, the watershed approach has emerged as the preferred contemporary approach to address persistent water resources issues left unaddressed by historical approaches. Watershed initiatives, which utilize watershed approaches, strive to be collaborative processes (Gregg, Kenny, Mutz, Rice 1999). Public participation is needed to achieve a comprehensive collaborative process; and, public ownership and involvement is a key to success (EPA 1996). Within the modern approach everyone is recognized as part of the problem and as part of the solution, rather than "pointing the finger" at one isolated industry and their discharge pipe. Therefore it is necessary to involve all the players, especially the public, in the watershed planning process.

This thesis recommends how to most effectively involve the public in watershed planning. First, I present a history of water resources management. Second, I discuss public participation in planning. Third, I discuss modern water resources management, watershed planning. Traditional and modern methods of public participation were examined in water resources management, in planning, and in current watershed initiatives. This evaluation assisted determination of criteria for successful public participation and warning signs of unsuccessful public participation Recommendations were made for effective public participation based upon the literature review, surveys, and case studies.

# Introduction

Today, numerous watershed efforts are developing and proceeding across the United States. These efforts have developed as both agency coordinated, Top-Down approaches, and/or locally initiated and driven, Bottom-Up approaches. The Top-Down watershed initiatives have historically developed to address specific isolated water resource issues while Bottom-Up initiatives have developed to address water resource issues using a collaborative process. It is clear that the watershed is now becoming more recognized and accepted as the proper geographic and political boundary to address environmental resource management issues, such as water resources. Many of these efforts have been deliberately developed by government agencies, while others have developed as ad hoc or grassroots efforts. While it may not always be clear why an initiative began, it is clear that these watershed approaches are having positive impacts (WGA and WSWC 1994).

The modern watershed approach varies greatly from the historical approach to water policy. People are becoming more aware of the tangible threats to the nation's water resources, such as economic losses, threats to aesthetic values, decreased recreational uses, demise of cultural heritage, environmental degradation, and threats to human health. This results in a recognition of the interconnectivity of water to society, economics, and the environment, and a call for comprehensive water resources planning and policy (Western Governor's Association 1994).

Measuring the success of watershed initiatives is not an easy task. Just as watershed initiatives vary in response to numerous variables such as age of the initiative and goals and objectives, so do the measures of success. Perhaps the first method to determine if an initiative is successful is to define and recognize the indicators of both success and failure The Center for Watershed Protection defines failure as "the inability of a plan to meaningfully prevent or reduce cumulative impacts at the watershed scale in the long-run" (Schueler 1996). In turn this

organization defines success as a "protection plan that produces the desired long-term outcome of protecting water resources from degradation" (Schueler 1996). Given that both these definitions look for long-term success, criteria must be developed to measure short-term success. Gauging short-term successes aids in providing feedback and evaluation to assure that a process is proceeding on a positive path towards long-term success.

To assure the success of existing and subsequent watershed projects it is necessary to understand how to most effectively develop and apply and watershed framework. With broad involvement being critical to the process (EPA 1998), it is important to understand the role of public participation in watershed planning to develop guidelines and recommendations to produce the most effective public participation, resulting in the most effective watershed initiative. In order to achieve this, a brief review of the history of water policy and water projects was conducted, and then a review of effective public participation in planning, and finally a summary of the modern watershed approach and the role of public participation in this approach.

## History of Traditional Water Policy

A timeline of the emergence of watershed planning throughout the history of water resources management is shown in figure 2.

### Early History

From the beginning of managing water resources the federal government has led the process. Traditionally, the water issues addressed were navigation, flood control, hydroelectricity, and irrigation. The water projects occurred as a response to specific needs and interests with little to no coordination within or between regions (Feldman 1991). Only recently has watershed planning, comprehensive planning for an area's water resources, emerged as a widely applied method for water resources management. This shift to comprehensive resource management

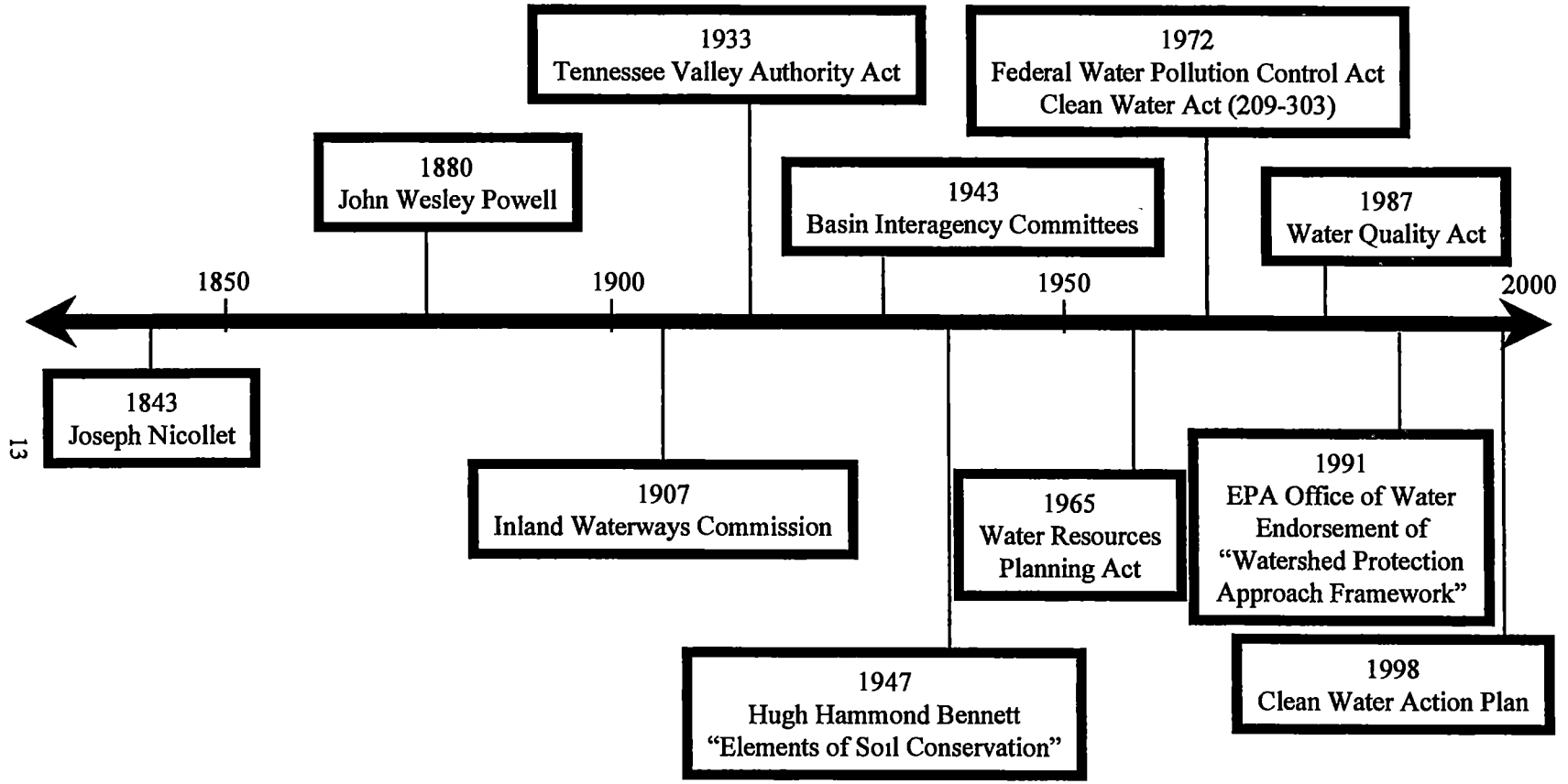


**Figure 2. Timeline of Watershed Approaches**

results from recognition of the interconnectivity of water resources on the environmental, social, and economic aspects our nation's communities.

Initially water resources policy focused upon economic development at the regional and national levels. As early as 1784 George Washington chaired a committee to investigate the navigation potential of the Potomac River, and the possibility of connecting the Ohio and Potomac Rivers by road (Kenny & Reike, Schad 1964). The first water resources report, The Gallatin Report, was issued in 1808 planning for the development of a national connected waterway systems (Kenny & Rieke 1997, Fox 1964).

Regional interests called for water projects to be subsidized to lessen hardships to states and private parties, leading to the deferment of who would pay for projects (Feldman 1991) and advocating a greater federal role in water projects. The majority of engineering expertise was also held by the federal government and represented by the development of the Army Corp of Engineers in 1802. By the 1820's the Corps was involved in large-scale civilian projects to address navigational and flood control issues (Kenny & Rieke 1997).

Due to differences in geography, geology, and climate, water projects in the West differed from that of the East, focusing mainly upon water supply issues such as irrigation, domestic water supply, and hydroelectricity. Traditionally, environmental and social impacts were not included as part of the projects' equations in either region despite recommendations of insightful men. Joseph Nicollet, a French explorer who surveyed the Upper Mississippi River Basin in 1843, was the first to recommend that the boundaries of the new territories, such as Iowa, should follow the boundaries of the river basins (Getches 1998). His advice went unheard until 1880 when an American explorer, John Wesley Powell, made recommendation to the President to organize political boundaries for decision-making according to hydrologic boundaries, watersheds (Colten 1996). John Wesley Powell's recommendation called for the management of American water resources based upon "sociopolitical organization." modeled

after ancient fluvial communities in Egypt, China, and Mesopotamia. "Powell understood in the 1870's not only the geological, but also the political and social significance of a watershed: that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of the community" (Brown 1997). His plan was to "establish self-government by hydrographic basins," a revolutionary idea for linking the institutions of land and water. However, federal legislation ignored the advice of Powell, taking the path of "land disposal practices." This strong federal role was further supported by The Reclamation Act of 1902, which established the Reclamation Service that later became the Bureau of Reclamation in 1923 (Kenny & Reike 1997).

Feldman (1991) states that past efforts to coordinate on water projects both on federal and state levels were narrow in their focus The focus was solely on water supply, water rights, navigation, or flood control, not on the big picture, of the watershed. The big picture includes more than just the single economically driven water projects. The big picture should account for the social and environmental impacts within the watershed or downstream of water projects like dams and diversions. In addition, these efforts did not seek to establish any long-range plans for comprehensive environmental planning. Instead, the energies were focused as reactionary and ad hoc solutions to immediate problems. In terms of public participation, this approach to water resources management addressed the needs of those with the most power, or loudest voice. It was not comprehensive in addressing the wide range of issues and incorporating the voices and opinions of everyone affected by the project.

## Comprehensive Planning

The need for comprehensive planning based on watershed levels as address by John Wesley Powell in 1890 was not supported by legislation of the 1800's but was later endorsed by

conservationist leaders in the 1900's. In 1907, Teddy Roosevelt issued an executive order to appoint the Inland Waterways Commission stating that "Every river system, from its headwaters in the forest to its mouth on the coast, is a single unit and should be treated as such" (Inland Waterways Commission 1908). The establishment of the Waterways Commission was the first step towards addressing issues on a watershed scale, but with the focus on the river basin. In 1933 Roosevelt also approved an act initiating the Tennessee Valley Authority (TVA). This act initiated the building of dams for hydropower, flood control, economic development, and recreation. While this differs from modern holistic watershed approaches, this was the beginning of watershed-based planning on the Tennessee River "It (TVA) should be charged with the broadest of planning for the proper use, conservation and development of the natural resources of the Tennessee River drainage basin and its adjoining territory for the general social and economic welfare of the nation..." (Roosevelt message to congress 1933)

By 1943 the era of river basins, basin interagency committees, began with the formation of the Federal Interagency River Basins Committees (FIARBC). These "firebrick committees," as they were called, were "generally considered to have been ineffective vehicles for integrated resource management, primarily because they provided no real incentive for coordination. It was Congress, and not the firebrick committees, who approved or rejected proposed development schemes" (Kenny and Rieke 1997). Despite the perceived failures of the firebrick committees the concept of watershed planning was still spreading. In 1947 Hugh Hammond Bennett wrote the "Elements of Soil Conservation" in which the importance of watershed planning in soil conservation was recognized. Bennett stressed that the effective planner must "consider the land's relationship to the entire farm, ranch, or watershed" (Natural Resources Conservation Service (NRCS) Handbook 1995).

The 1960s began with the disintegration of the firebrick committees, resulting from the failure of federal agencies to effectively combine their efforts and to include state participation in

the planning process This gave way to the emergence of new river basin organizations in the 1960s that were more regionally accountable and more formal. In 1965 the Water Resources Planning Act was passed developing several "interagency-interstate commissions" (Kenney 1997).

The call for reform and comprehensive water resources planning in the 1960s by the federal government was reactionary to the droughts in the East and a growing demand for water resources in the West. It became clear that water resources management must take into account the environmental and social factors to plan for the future, due to growing populations, new demands on water resources, and acknowledgment of unpredictable weather. Additionally, the failure of the firebrick committees made it clear that coordination and cooperation allowing non-federal participation were vital to the success of watershed management. "Comprehensive planning in water resources policy attempts to coordinate public participation in policy formulation with the efforts of agencies at all levels of government" (Feldman 1991).

## Clean Water Act

In 1972 the Federal Water Pollution Control Act, commonly known as the Clean Water Act, was passed "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Clean Water Act 1972). The goal of this act was to make the waters of the nation "swimable and fishable " To date, only 66 percent of the nation's waters meet this goal. While this is a success, a major gap exists in addressing the nation's water resource issues. The traditional regulatory approach has focused upon point sources of pollution, "end of pipe pollutants" that are easily identified such as sewage or industrial discharges. This regulation has been applied mainly through National Pollutant Discharge Elimination System (NPDES) Permits, which allow a polluter to generate a set amount of pollutant over a given period of time. While this may be successful in mitigating one problem, the problem of point-source pollution, it does

not account for the cumulative impact of existing land use and projected land use changes within the watershed, such as polluted runoff and loss of wetlands which are vital in cleansing water of pollutants (Hoerath 1997). The Clean Water Act's inability to address non-point source (NPS) pollution and cumulative watershed changes and subsequent impacts led to many subsequent amendments of the act. These amendments set precedent for the emergence and application of a new approach, the watershed approach.

The 1987 Clean Water Act was the final set of amendments to the Federal Clean Water Act of 1972. Under section 304 EPA set guidelines for controlling nonpoint sources (NPS) of pollution based on water quality and designated uses rather than uniform technological standards for the entire nation. Additionally, section 319 required that states assess their waters to determine which water bodies were not in compliance with water quality objectives due to NPS pollution. The states were then charged with developing management and implementation plans, with funding from state revolving fund (SRF) loans, to reduce NPS pollution. (National Research Council 1999)

In 1991 the US EPA endorsed a watershed-oriented approach to meeting the goals of water quality as mandated by the revised Clean Water Act. The watershed approach, as endorsed by the EPA, emerged offering a better method to address all of the issues, point source and non-point source, within a watershed, resulting in determination of better actions for water resource prioritization, preservation, and restoration (US EPA OWOW 1999). "The Watershed Protection Approach is a comprehensive approach that takes into account all threats to human health and ecological integrity within specific watersheds" (US EPA 1998). This is not to imply that the watershed approach, as endorsed by the EPA is the only watershed-based management approach. On the contrary, there are many variations of watershed-based planning approaches; but, they all share common characteristics with EPA's suggested approach. In 1998, the Clinton Administration approved the Clean Water Action Plan. This plan is "a multiagency effort to

fulfill the goals of the 1972 Clean Water Act, it utilizes watershed-based management as the primary approach for future water resource protection and restoration efforts (Wedel, 1999).

## Public Participation in Planning

Community-based planning and citizen participation have emerged as a rebirth of democratic activity (Hester, Jr. 1999). Planners and grass-roots organization organizers are supporting participation as a way to assure and improve the products of their labor, yielding increased ownership of projects and greater ease in plan implementation (Chait and Seip 1999). Public participation in planning is a vital part of the foundation to implementing a watershed approach. "The direct involvement of citizens in identifying problems and envisioning solutions is key to the success of watershed strategies" (Clean Water Action Plan 1998). Therefore, it is necessary to look at the general history of public participation in planning to increase the effectiveness of public participation within watershed planning.

### History

Public participation in planning is based on the same principles held by one of our country's founding fathers Benjamin Franklin felt that every citizen's opinion was important, making active participation in government a moral imperative (Hester, Jr. 1999). This historic role of public participation, supported by Franklin, is further supported by the First Amendment to the Constitution, granting the freedom of speech, the right to peaceably assemble, and the right to petition the government. Also, this local participatory role is supported by the Tenth Amendment empowering the states and people "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people" --10th Amendment to the Constitution of the United States This allows people the power to make decisions that are not explicitly covered by the Constitution.

Traditionally, for more than one hundred years, the daily operations of most local American governments were directly guided by elected officials. However, by the late 1800's it was realized that not all elected officials could totally handle the increasing amount of work and complexity of urban issues This, combined with concerns about government corruption, led to a call for reform of many local governments. This reform came in the way of professional city management. An unpredicted side effect of this reform was the separation of citizens from the decisions concerning their local environments.

The civil rights movement caused a shift from the professional city management movement. The public became aware of legal, social, and educational issues stemming from poverty and racism. The participatory nature of the advocacy movement extended way beyond the primary issues "The civil rights movement rekindled local participatory democracy in every aspect of city life and changed the way citizens participated in city making" (Hester, Jr. 1999). During these time those who stepped forward to "grease the wheels of democracy" were often called anti-American agitators, but they acted upon the democratic principles on which this country was established (Pharr 2000).

During the civil rights era incredible local participatory success stories emerged However, some of the participants soon exhausted as they realized they did not have the time, energy, or additional resources to take on the amount of responsibility required by the process. The responsibilities of this process required participants to compromise their schedules and normal lives for the sake of voluntary public service.

To some, the activities since the 1960s have led to a loss of trust in science. People saw "bogus science justifying growth and environmentally disastrous projects," this "turned to skepticism and disdain" (Hester, Jr. 1999). This resulting distrust in science, leaders, experts, and even rational planning further complicates today's objectives of effective participation in planning.

A shift in participatory planning is occurring. Perhaps the most successful and widely applied form of participatory planning today, a typically passive form of participation, is that of "informing and educating." Thirty years ago, and even occurring today, "government representatives often simply informed citizens of plans after they had been finalized" (Hester, Jr. 1999) Today, grassroots organizations such as watershed organizations are using more sophisticated educational and outreach campaigns to empower the people to influence the decision-making process Some of these more sophisticated methods included research of other groups' activities, newsletters, computer networks, primary field research, aid of experts or specialists, and the assistance of advocacy organizations. "Education, once aimed to manipulate citizens at the grassroots, has become one of the most powerful grassroots tools" (Hester, Jr. 1999). This shift towards education and empowerment at the grassroots level is evident in natural resources management, such as watershed-based initiatives.

## Benefits and Challenges

Klein (1999) claims that the United States is not a highly participatory society. This mirrors historical water resources management in that the educational system teaches citizens not to participate, but to accept laws and authority, much as the public has typically had little role in water resources issues as one or two agencies created regulatory decisions often reluctantly accepted by the public. However, participation in modern planning seeks to attain high goals of a "just, equitable and humane society." In this respect, participation can be useful, bringing diverse interests together and minimizing past dissatisfaction with issues. Also, environmental justice, equal representation for people of all ethnicities and incomes, should emerge, empowering those within the community who have been traditionally disempowered. With these benefits of participation also come challenges. The groups or individuals initiating a planning process may purposely or inadvertently use participation as a way to control the issue focus. Also,

participation may purposely or incidentally become a method by which groups identify and purge groups or individuals with differing viewpoints (Klein 1999).

In some planning processes participation has received a negative image. NEPA and other projects that mandate public participation demonstrate this negative image. These participation mandates can lead to symbolic participation in which "participation is usually done to satisfy mandated requirements and is not intended to fully engage the community" (Francis 1999). Essentially, mandated participation is reduced to comment periods, a very limited process in terms of participation (Shiffman 1999). Also, if participation is not done properly, it can reach a point where people just argue about issues but do not get anything done (Halprin 1999, McNaly 1999). For example, if a watershed group forms but cannot agree on a mission, goals, or objectives they will likely lack direction and focus. People need to come together and focus their diffuse energies; this equals power, which leads towards success (Pharr 2000).

The participatory planning process is not without challenges and criticisms. However, this is a process that often results in a more effective planning process outcome. Watershed initiatives, as participatory planning processes, also possess potential to be more effective that traditional approaches to water resources management.

## Modern Water Resources Planning: The Watershed Approach

In response to continued water quality problems, the watershed approach has developed as a community and watershed level process to address water resource issues. Today many different federal, state, local agencies, and citizen groups employ this approach as a comprehensive process relying upon multijurisdictional and multidisciplinary partnerships (EPA 1998). The Environmental Protection Agency has defined the watershed approach as "a coordinating framework for environmental management that focuses public and private sector efforts to address the highest priority

problems within hydrologically-defined geographic areas, taking into consideration both ground and surface water flow" (EPA 1996).

This approach differs from the historical approaches to water resources management by focusing on comprehensive planning rather than focusing on one specific water quality issue or water project. To illustrate, community, economic, and environmental values, and impacts are to be considered with respect to projects such as water diversions or flood control. The guiding principles of the watershed approach seek to fill in the gaps created by past water resource management efforts and policies by establishing significant comprehensive restoration, maintenance, and protection of water resources.

## Definition

"The Watershed Protection Approach (WPA) is a comprehensive approach that takes into account all threats to human health and ecological integrity within specific watersheds" (EPA 1998).

Essentially, watershed planning is a term that encompasses an emerging concept in water resources management. Many different federal, state, and local agencies, groups, and other organizations now apply this framework using many different terms, including watershed protection approach, watershed management, watershed planning, or watershed framework. Regardless of the term used, the framework for these water resources planning processes share several features in common.

There may be as many different watershed approaches as there are watersheds and/or groups applying a watershed approach This approach is used by various federal, state, local, non-profit, and community-based groups around the nation Some of the most widely recognized groups utilizing this approach are EPA, TVA, Tennessee Department of Environment and Conservation (TDEC), a non-profit organization River Network, and a university affiliated non-

profit and private sector partnership Purdue's Conservation Technology Information Center (CTIC). These approaches vary based on the priorities, objectives, goals, timing, available resources, issues, etc However, all watershed approaches should contain the following commonalties, or guiding principles, as identified by EPA's Watershed Approach Framework: 1) Partnerships, 2) Geographic Focus, and 3) Sound Management Techniques (EPA 1998).

## Partnerships

"A watershed is a useful unit to draw in the necessary players... it hosts the people and surrounds the variables" (WGA 1994).

Partnerships are the involvement of all the affected people and parties in the decision making process throughout the duration of a watershed approach project. Essentially, it is the union of public and private interests towards a common goal. Establishment of strong partnerships from the initiation of a watershed project seeks to integrate and coordinate environmental objectives with social and economic aspects of a given watershed. Additionally, awareness and participation are developed to increase ownership and acceptance of watershed projects.

The "problem-shed approach" is also another effective way to identify and incorporate partnerships. This approach, described in more detail below, may extend beyond the geographic bounds of the watershed to "recognize and involve all affected parties within the area encompassed by the problem or set of problems that must be resolved simultaneously" (WGA 1994).

## Geographic Focus

The planning activities are based on a watershed-level. "A watershed is an area of land that drains into a lake or river" (Purdue CTIC). Watersheds vary greatly in shape and size. A

watershed can be a small creek or pond draining just a few acres of property or as large a the Mississippi River basin that drains the lands of numerous central states. "A watershed encompasses not only the water resource, such as a stream, river, lake, estuary, wetland, aquifer, or coastal zone, but all the land that drains into the resource. The appropriate scale of a watershed management unit depends on the physical, political, and resource conditions of the area of interest" (NRC 1999).

The watershed approach is community-based protection using watershed or hydrologic boundaries to define the problem area." (EPA OWOW 1998). Depending upon the scope of the problem, broad or narrow, a watershed to a sub-basin approach may be more appropriate. Many watershed managers recommend starting on a larger watershed scale and then breaking the problem down into smaller sub-watershed, basin, or sub-basin scales to target specific issues while maintaining a holistic approach. For instance, the French Broad Watershed involves two states and numerous communities with varying issues, making it too big to address at one. However, broken down into smaller sub-watersheds the issues and solutions may be more easily identified. The watershed approach serves as a natural integrator of economic, social, and environmental issues better aligned with the public's orientation than that of traditional political boundaries (WGA 1994).

## Sound Management Techniques

The stakeholders within the watershed should utilize sound data, tools, and techniques to incorporate into the decision-making and planning process. EPA's recommended steps in this planning process are as follows: 1) assessment and characterization of natural resources, 2) goal setting, 3) prioritization of problems, 4) development of alternatives and an action plan, 5) implementation, and 6) feedback and evaluation

## Benefits

The development of a watershed approach is beneficial in more than just the environmental sense The comprehensive process also incorporates social and economic benefits within a watershed region. Through partnerships agencies and people from all levels of government and the private sector can share information to better understand cumulative land use impacts and to prioritize watershed problems. This partnership saves time and money while bringing people together, avoiding time and money wasted by duplicative and/or conflicting efforts. The approach can increase the likelihood of maintaining environmental improvements through developing a sense of community, conflict reduction, and increased commitment to projects.

"The Direct involvement of citizens in identifying problems and envisioning solutions is key to the success of watershed strategies" (Clean Water Action Plan 1998). The watershed protection approach relies upon the involvement of stakeholders, which includes the general public, working together and sharing information From this, a common understanding of the priorities, goals, and responsibilities should emerge to maximize effective use of the available resources while increasing acceptability and durability of the projects.

The reliance upon stakeholder participation for the success of watershed planning makes it necessary to fully understand the scope of participation in the planning process. The greatest need for understanding is the role of public participation. Watershed planning is dependent upon comprehensive stakeholder involvement and most often it is the general public that is left out or only minimally involved in the process due to lack of information, interest, time, money, and other resources.

## Challenges

As with any successful planning processes, success cannot be achieved without acknowledging potential obstacles and challenges. Funding of a watershed project is important to support staff and resources to get the project initiated. EPA has created funding incentives for this process. Additionally, an inventory of baseline watershed data needs to be obtained and/or developed. And, of course, the affected public needs to be identified and involved in the processes. Mechanisms for identification of the affected public and mechanisms for further involvement are fully discussed in the Results and Discussion sections of this thesis.

Specific challenges associated with the public participation aspect of watershed planning, such as time, money, resources, and organization, are much the same as those identified within public participation in planning Participation has numerous benefits but does not come without challenges.

## Support

Currently, the EPA has developed methods to better support and encourage the use of watershed approaches. These incentives include increased flexibility in water quality reports, simplified permitting procedures, and priority consideration for grant money Additionally, the EPA Office of Water offers support through training manuals and workshops for watershed initiative organizers (EPA OWOW 1998).

## Public Participation

Public participation in watershed planning is much the same as participation in any planning process. The public must first be defined, the importance of this involvement must be

recognized, participation guidelines should be understood, and all feasible participation mechanisms should be employed to work towards a successful planning process.

Definition: "In successful watershed management efforts all interests and actors who desire to participate are welcome" (WGA 1994)

Importance Research and experience have demonstrated that the amount of public education and participation can directly correlate to the success of a watershed project (Durham and Brown 1999). It is public support that aids the process in moving from the planning stage to implementation. Project implementation requires many things including time and money, but also of great importance is that local governments and citizens "have ownership of the project" (EPA 1997).

One example of reliance upon public support for a successful, supporting the goal of protecting water quality, watershed project is the implementation of Best Management Practices (BMPs). It would be impossible to implement the use of BMPs without the support and cooperation of the private landowners, those slated to apply these methods. Additionally, public involvement aids in the understanding and acceptance of mid-course corrections because people are aware of and understand why these changes should take place. Through feedback and evaluation it may be necessary to make management and/or policy changes to increase the likelihood that the watershed initiative goals will be met. It is not likely that the public will be accepting of mid-course corrections if they are not involved in and have an understanding of the process (EPA OWOW 1998).

Recognizing that all of the recommended lessons for watershed successes rely either directly or indirectly upon public involvement, and that stakeholder involvement is a commonality in all watershed planning approaches, it is necessary to further study public involvement in watershed planning to work towards success.

## Summary

After conducting a literature review, several questions remain that are not directly addressed by the literature. To aid in answering these questions extensive watershed initiative surveys were examined and intensive literature studies were conducted of modern watershed approaches. These methods are discussed in detail in the following chapter, Chapter 3.0, Methods.

# CHAPTER THREE

# METHODOLOGY

Public participation in various watershed planning processes were analyzed through focusing on a series of carefully selected case studies to determine if and how this participation is effectively applied and to determine the best-prescribed methods to solicit public participation The research questions listed in the introduction section of this thesis were used to guide this analysis of the literature and the surveys.

## Literature Case Studies

Comparisons were made among the mechanisms of public participation in case studies from the current literature to determine criteria for successful participation. The secondary research question were utilized in analysis of the literature.

### Methods of Data Gathering

Literature on modern watershed planning, including workshops, conferences, and case studies, were reviewed to determine the effective and ineffective mechanisms for public involvement and to determine the impacts of the different methods of involvement.

### Data Quantification

A list of mechanisms utilized was developed and is found in the methodology section of this report Additionally, an evaluation matrix was developed and is in the recommendations and

discussion section of this report. These findings are not of a scientifically based method, but are illustrative. However, they do identify common observations in varying watershed-based efforts.

## Surveys

Surveys of various watershed organizations currently utilizing watershed planning processes were analyzed. These surveys were conducted by the University of Tennessee Water Resources Research Center. These surveys provided a means for evaluating research questions that emerged from the literature review .

Phase I of the survey identifies mechanisms of soliciting public input that are currently used. Phase II of the survey determined how the input, from the phase I survey, was applied and aided in developing success and failure criteria. A matrix, or "report card," was developed to aid in the evaluation of the literature and survey studies to answer the issues posed by the study.

Due to the extensive nature of the surveys, not all of the criteria set forth by the report card matrix were addressed within the surveys However, this broad sampling method did offer a representative sample of watershed groups to aid in answering the research questions.

### Methods of Data Gathering

Data was gathered by identifying and contacting watershed initiative groups that were currently involved in watershed planning processes After identification of the groups to be contacted, email surveys were sent to the watershed organization's main contact address. An agreement was made with the participating organizations to keep responses confidential, in order to encourage honest and candid responses.

## Identification of Watershed Groups

Groups involved in watershed initiatives were identified through the National Watershed Network National Watershed Library, online: http.//www.ctic.purdue.edu/NWE/NWE.html, and River Networks' River and Watershed Conservation Directory, online: http://www2.desktop.org/rivernetf/rivSearch.html. The criteria for groups to be involved in the study were that the watershed initiative be focused on a local level and that the organization have an available email address, allowing contact via electronic mail for quick and cost-effective surveys.

## Survey Development

The survey developed in response to an extensive literature review. The literature describing mechanisms for involvement only minimally explained the effectiveness of public participation in the process. While the literature offered information as to who should be involved, how they should be involved, and how the input should or could be used in watershed planning efforts it was difficult to determine the effectiveness of this involvement in the watershed planning efforts. As a result, the survey was developed in two phases to seek further exploration of areas where the literature was lacking information. The surveys' objectives were to determine mechanisms and criteria for successful participation. The surveys were kept fairly brief to encourage participation and response with a minimal time investment on behalf of the survey recipients.

Phase I was of the survey was developed to look at current watershed initiatives. The objectives of the survey were to 1)determine who was involved in the planning process (e.g., individuals, agencies, organizations, etc.) and 2) how involvement from the participants was solicited (e.g., surveys, public meetings, tours, etc.). See appendix B for a copy of the phase I survey.

The objectives of the Phase II survey were to identify how the participant organizations' input was utilized in the planning process (e.g., prioritize efforts, develop and support educational programs, policy changes, etc.). Secondly, the phase II survey was also developed to gauge the effectiveness of the participant input in carrying out the watershed initiative efforts. See appendix C for a copy of the phase II email survey.

## Survey Delivery and Response

Twenty-seven organizations were identified and contacted during phase I of the survey. The first mailing of phase I surveys occurred on December 10, 1998. See appendix B for a copy of the phase I survey. Initially, only five of the recipient organizations responded to the phase I survey. Considering that the survey was mailed during a busy winter holiday season a follow-up email was sent on January 12, 1999 to those who did not reply to the first email. After the follow-up email in January five more recipient organizations responded to the survey, making a total of ten survey responses for phase I.

One organization forwarded the survey to another watershed organization due to lack of time and knowledge, however, the recipient organization of the forwarded survey did not respond. Two of the surveys were returned for invalid email addresses and attempts were made via internet searches to identify the correct email addresses for the watershed coordinators and/or the organizations. The correct addresses were not identified. One of the recipient organizations replied stating that his watershed initiative was not at the local level. Thirteen of the twenty-seven organizations contacted simply did not respond. This yields a response rate of 37 percent

Subsequent to the phase I survey, phase II of the survey was developed The ten organizations participating in the phase I survey were selected to participate in phase II and were initially contacted on February 17, 1999 See appendix C for a copy of the phase II survey. Seven of the recipients responded very quickly to the survey. A second survey, identical to the first

phase II survey was mailed on March 3, 1999 to the remaining three non-respondents. Of these three, one organization replied to the survey resulting in a response rate of eight out of ten, 80 percent for the phase II survey.

## Data Analysis

Data was analyzed by developing a comparison chart for each phase of the survey The number of organizations answering each question option were recorded and totaled. In addition, comments were recorded to aid in interpretation of the data and results. The data and results are presented and discussed in detail in Chapter 4.0.

# CHAPTER FOUR

# RESULTS

## Literature Case Studies

This section explores the literature, including case studies, to determine criteria for successful public participation, determine the best methods for increasing the effectiveness of public involvement, and to determine if the modern planning approach is more effective. To do so, some of the research questions first posed in the introduction were explored.

1. How is the public defined?
2. How is participation defined?
3. What are the mechanisms of public involvement?
4 How can success be measured in terms of public participation?
5. How can failure be measured in terms of public participation?

### How to define the public

Successful efforts involve a broad range of participants from the onset. Anyone who thinks that they are affected, maybe affected, has any interest, or thinks they may have interest in the project should be involved in this broad range of participants (EPA 1998, WGA 1994). Efforts to identify and involve participants should be proactive to mitigate any potential negative feelings, which may slow or halt the implementation of a project. In particular, efforts should seek to further identify interests that may not be represented by an already existing group. In addition to preventing surprises, early identification of participants may help to identify

concurrent efforts that may prove to be valuable partners in terms of data, resources, time, and power.

A citizen survey can be an extremely effective way to initially define and involve the public in the watershed planning process. This survey process aids in identification of where the public stands on the issues at hand without dictating any specific actions This process also aids in determination of congruence or incongruence between the organizing agency's or agencies' objectives and goals and the publics' perceptions. Additionally, surveys further define the public, increasing potential for substantive participation, and ultimately a successful watershed planning process (Plumlee 1995). Application of a telephone or mail-out survey can be viewed as passive participation, causing participants to feel less enthusiastic about participation and as if they are not truly being involved. Some community-based organizations prefer the application of face-to-face surveys, front porch meetings, and workshops at schools, churches and other activity centers within the community as a more active form of public participation to aid in definition of the affected public while soliciting involvement (Hunley 1999).

If the application of a survey appears too timely, cost restrictive or requires additional or unavailable staff, a query of key contacts may be a quick and simple way to identify public perceptions and to further identify the public. However, planners must take caution that moving too quickly in a process can lead to misidentification of the public and potential problems from unidentified publics upon reaching the implementation phase (Thomas 1995).

Additional Stakeholders: Public involvement often refers to the general public, and is not likely to be effective without the coinciding involvement of the other important stakeholders. Many contemporary issues, such as water resources planning at the watershed level, cross traditional political boundaries and require the cooperation of many different agencies and functional departmental divisions. These issues cannot be addressed by a single organization, thus requiring the joint cooperation of many different public and private agencies and citizens.

Inclusion of all the important actors, from governments to citizens, from the initiation of a project precludes cooperation that may prove essential to the decision-making process and ultimately implementation of subsequent policies (Plumlee 1999). Purdue's Know Your Watershed Project lists several stakeholders that should be involved including the mass media, local government agencies, landowners, local elected officials, financial institutions, environmental groups, businesses, industries, farmers, chambers of commerce, civic organizations, retirees, students, teachers, religious leaders, and women's groups (Purdue CTIC 1998). Additionally CTIC defines stakeholders as "any individuals or groups who have an interest in or will in some way be affected by your watershed management efforts. They include those who will benefit from affected water quality, as well as those who will pay for land management or other changes." Figure 3 shows that stakeholder involvement is central in the watershed approach and that this involvement is vital to every step in the planning process.

Scale of focus: Recognizing watershed approaches as community-based protection, many different stakeholders from different watersheds convened at a conference in Boise, Idaho in 1994. They agreed upon the importance of comprehensive recognition of the diverse interests that may potentially be affected by watershed decisions. "The best decisions are made by those closest to and open to all the people affected by them" (Western Governors' Association 1994). The term "problem-shed approach," recognition and involvement of "all affected parties within the area encompassed by the problem or set of problems that must be resolved simultaneously," emerged to describe the scope of the watershed problem and to aid in definition of the stakeholders that should be involved in the planning process. (WGA 1994) A problemshed can exceed beyond the geographic boundaries of a watershed; but, it is of vital importance to include all affected or interested parties regardless of where they reside. The scale of the watershed should be just big

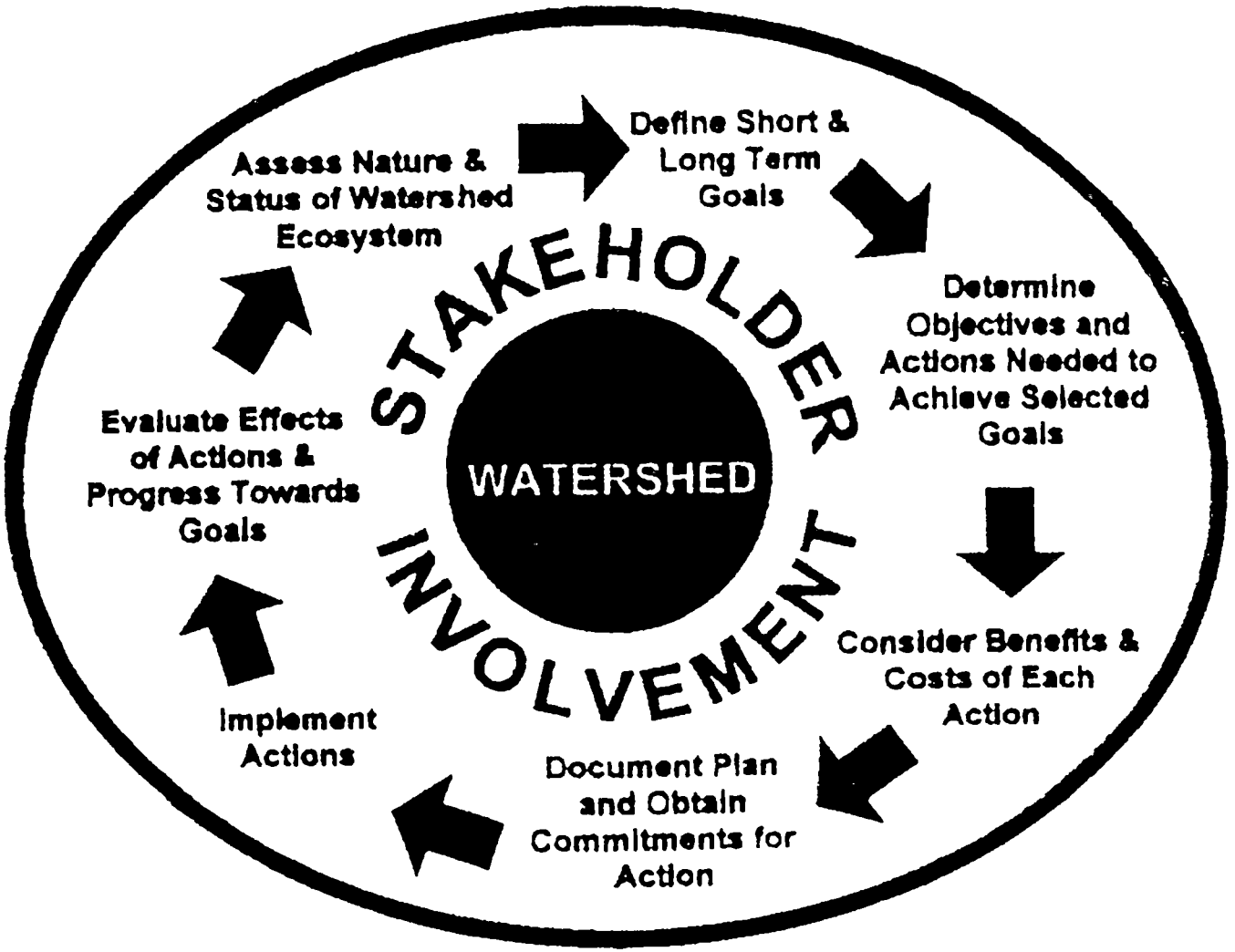


**Figure 3. Watershed Management Approach**

enough to contain the "problem-shed" and the "solution-shed," the land area and stakeholders necessary to identify issues and to implement an agreed upon solution.

## How to define participation

"Participation is a dialogue, between you and the people you are working with" (Shiffman 1999). It is important to recognize participation as an active process in which people engage in dialogue. Also, this is a process that takes time and for the process to be successful the public participants must be aware of this from the onset. In order to effectively communicate with the participants the planners need to present data and communicate concepts in layman terms that can be understood by everyone (McNaly 1999). Effective communication will aid in the establishment of clear visions and goals. Additionally, an effective participation process requires that the citizens have the power to influence decision-makers and decisions (Shiffman 1999).

## How to involve the public

Historical Role of Public Participation: Citizens may be invited to have a role in the planning process, as called for by the federal Clean Water Act; however, this role in the past has been viewed as symbolic, or passive. This symbolic role is defined by citizens being present at public meetings and participants as advisory committee members and being recorded as "participating" in the process. This form of participation does not necessarily lead to effective participation in the planning process. For the process to be effective substantive, or active, participation needs to occur, in which the participating citizens "actually have a hand in creating a water quality plan" (Thomas 1995, Plumlee 1985).

The motivating factors for public participation in many watershed initiatives are responsive to the exclusionary nature of the water resource management decisions of the past The traditional top-down approaches generally were inconsistent with local goals and threatening

to local economic, social, and environmental values This approach was also frustrating in terms of minimal opportunities for public input and participation, and conflict concerning outsiders, people not directly involved or affected by the resource decisions, making water resource policy decisions (Thomas 1995). The watershed approach has emanated as a method to attempt resolution of past conflict and frustration through a new approach to water resources planning (WGA 1994)

Motivating Factors: Methods of involving the public in watershed planning and subsequent watershed projects are numerous. However, the methods of public involvement vary based upon the characteristics and resources of any given watershed project (EPA 1998). Some of the simple factors motivating the public to be involved include a feeling that a person is personally affected, a feeling that a person will be part of the outcome, and a feeling that a person can and will influence the short and long-term decisions resulting from the process.

Some motivators for public involvement are fear, conflict, aspiration for self-destiny, or the chance to protect a public trust. However, for any participant to stay involved and committed to a project a person must feel as if he or she is making a difference by being involved This can be encouraged through "measured success," feedback, and positive reinforcement stating that goals have or are being achieved Some participation motivation guidelines are 1) perceived personal affect due to project, 2) opportunity for ownership of the outcome, 3) stable structure, 4) credible process, and 5) sound leadership (WGA 1994)

Tradeoffs: Project planners, such as those involved with community-based efforts in Birmingham, Alabama, have stated that the participatory process takes longer. However, this process also resulted in better solutions, more environmentally equitable and effective, than professionals felt they could have reached on their own Door-to-door surveys were utilized to identify the public and prioritize issues New relationships were established within the

community increasing the acceptance, implementation, and durability of the projects (Pigford and Wight 1999).

TVA has developed a model to determine how much time and energy should be spent on the different parts of the planning process. An example of this model is shown in figure 4. Through this model they gauge the current level of interest and knowledge of water issues versus the resource needs to determine if they should spend more time and money on the education aspect to get people informed and involved. Or, if people are already interested and aware of the issues, they can better use their time and resources to help the community come together in a watershed approach to address the issues. (Sagona 1999)

Methods: The EPA Office of Wetlands, Oceans, and Watersheds promotes the formation of citizen review groups and technical committees as an effective method This method has demonstrated increased support from diverse watershed interests. Additionally, it can provide a solid group of community leaders that evaluate and encourage continued project success after initial implementation is complete.

While it is impossible to encourage every single citizen to leave his or her house for a public meeting Planners seeking effective public involvement must exercise all feasible methods to make opportunities for involvement attractive and accessible Some recommendations include a type of "meeting etiquette," scheduling meetings at convenient times and in easily accessible and convenient places, notifying the public well in advance of the meeting time and location, and making it clear to the public how important their input is to the process. All of these methods work together to further define, notify, and involve the public (Plumlee 1995).

Mechanisms: Table 1 contains a comprehensive listing of the mechanisms for public involvement as compiled from the literature and watershed surveys These mechanisms are also listed and described below. Participation can take on two different forms, active and passive. Active participation involves interaction and action from the participants while passive




**Figure 4. Primary Watershed Approach Assessment**

**Table 1. Public Participation Mechanisms**

| Public Participation Mechanisms | |
|---|---|
| **Active Mechanisms** | **Passive Mechanisms** |
| 1. Volunteer or Citizen Monitoring | 1 Educational Programs |
| 2. Regular Meetings | 2. Websites |
| 3. Phone Calls & Telephone Trees | 3. Listserves |
| 4. Demonstration Plots | 4. Newsletters |
| 5. Watershed Tours | 5. Letters |
| 6. Awareness Walks | 6. Information Campaigns |
| 7. Field Trips | 7. Media Relations |
| 8. Canoe Trips | 8. Guidebook, Handbook, Resource Guide |
| 9. Cleanup and Restoration Days | 9. Public Opinion Surveys |
| 10. Workshops | |
| 11. Focus Groups | |
| 12. Local Ordinances or Zoning | |
| 13. Cost Sharing | |
| 14. Visual Preference Surveys | |
| 15. Committees and Task Forces | |
| 16. Creative Approaches | |

participation is more of an educational and informative form of participation, with little to no direct interaction and action.

## Public Participation Mechanisms

Active Participation:

1. Volunteer or Citizen Monitoring

Volunteer monitoring effectively involves the public in efforts to evaluate and prioritize problems within their watershed. In addition, monitoring empowers the participants through education and hands-on experience. Simultaneously, monitoring provides valuable data needed for the assessment and characterization of the aquatic resources (EPA OWOW 1998).

2. Regular Meetings

Utilize good meeting etiquette. The location and time of these meetings should be posted well in advance of the actual meeting Also, the meetings should be scheduled at a time that is convenient to the general public, not during hours when people are working. Also refreshments and others incentives can be useful to encourage people to attend meetings.

3. Phone Calls & Telephone Trees

Direct phone calls to specific people within a watershed are a more personal means of inviting people to a meeting Phone calls are also an efficient way to administer a survey. A telephone tree is much like a pyramid where several people are initially contacted and then those people call several more people who call several more people, etc. to inform about upcoming meetings or to relay information

4 Demonstration Plots

Demonstration plots can serve a function similar to that of Visual Preference Surveys and photos. These plots may be restoration sites, demonstrating the type of improvement that can be

achieved and giving the public a better understanding of the characteristics of a healthy stream, river, lake, and/or watershed.

5. Watershed Tours

A guided tour of a watershed aids in recognition of water resources and issues that the public may have previously been unaware. These tours may be conducted on foot, by boat or car. Watershed tours are an excellent way to educate people new to the initiative and to inspire discussion and action These watershed tours are much like the Awareness Walks, as listed below.

6. Awareness Walks

One successful method of involvement cited in the literature is the application of a series of workshops that begin with an "awareness walk." This walk or tour builds a "common language of experience" (Halprin 1999) among the participants, placing them upon a common ground. After the tour, participants come together to discuss their feelings about the place and to establish a vision, goals, and objectives by consensus. This method may be applied to river front developments, urban revitalization, watershed planning, or any planning processes. One of the keys to success is to assure that the facilitator(s) are well trained to be objective and to aid in taking the workshop from dreams to reality "The more people that can be brought into this elective process of creativity, the more you can make it visible to people that this is joyful and that it results in adding a wonderful quality to people's lives" (Halprin 1999).

7. Field Trips

Field Trips are much the same as watershed tours. However, field trips can be more involved and comprehensive than a simple tour. Field Trips can include camping overnight at a watershed's headwaters and canoeing or hiking through out the watershed. This method aids in teaching an understanding of watersheds and their interconnectivity to people's lives, urban or

rural. Additionally, people in the community have an opportunity to meet and establish trust and a working relationship.

8. Canoe Trips

A canoe trip can be a part of a field trip or a watershed tour. Canoe trips are exciting and entertaining People become more aware of water resources and the values of this resource. Canoe trips are appropriate for both the young and old. Costs can be minimal for this activity, especially if partners provide boats and/or portage areas.

9. Cleanup and Restoration Days

Cleanup and restoration days focus citizen efforts for a single day. Whether the focus is upon shoreline stabilization and restoration or removing tires and trash from a lake or creek, participants come away with a sense of accomplishment Citizens become aware of the water resources and recognize a tangible goal as the shoreline is stabilized or the lake becomes clean.

10. Workshops

Typically workshops are very interactive processes where citizens exchange ideas and develop visions, objectives, and goals. One popular planning process that may be applied to watershed planning processes is a nominal group process. This process allows each person to voice his or her opinion, creates an organized forum for discussion, and ultimately ranks the issues for prioritization.

11. Focus Groups

These groups are similar to workshops in that they are interactive. A small group of participants representing a population are selected to gauge their viewpoints and solicit their ideas.

12. Local Ordinances or Zoning

Citizens' presence and input at city council meetings may influence land use decisions that affect the watershed. Depending upon the political environment this input may or may not

affect the decision-making process, but it is worth the effort. Additionally, citizen presence at city council meetings informs local leaders of the community's awareness, involvement, and concern with local issues

13 Cost Sharing

Cost sharing is a method to encourage local business and even residents to contribute to watershed projects. This cost sharing may take form of financial contributions for projects or as in-kind support to offset costs. Through this process, those sharing the cost form a sense of project ownership.

14. Visual Preference Survey

This method involves a photographic documentation of water quality conditions and habitat improvement. This method is useful in three respects; 1) to understand the community's current perceptions of their watershed, 2) to understand their vision for the future, and 3) to provide feedback and evaluation of goals attained. Refer to *Smart Growth for Tennessee Towns and Counties: A Process Guide* (English et al 1999) for more information on visual preference surveys. This is a useful and dynamic planning tool that may be applied to varying types of planning processes.

15. Committees and Task Forces

Committees and task forces are similar, expect that a task force focuses on one or a few specific issues. These groups tend to be small and aid in advising and guiding the groups' activities in respect to the vision, objectives, and goals These groups can be composed of experts or volunteers They may be nominated, appointed, or volunteer, depending upon the nature of the process.

16. Creative Approaches

Be creative in developing various activities to involve the public while having fun and even raising money for the group's cause Creative ideas may include a golf tournament where

golf course BMPs are emphasized, running race following the course of a creek or river with a focus on the importance of water, or snorkeling in the river. Make the activities creative and fun and more people will be interested in participating!

Passive Participation

1. Educational Programs

Educational programs, such as Adopt-A-Watershed, can be developed and implemented in schools. The education of young people about watersheds instills values and spreads to their parents and friends. Additionally, civic groups, churches, other local organizations are good populations to target for educational efforts. Education of adults may provide enlightenment and induce positive watershed actions.

2. Websites

Websites provide a fairly low-cost method to relay information to a vast public. Also, a well maintained webpage can provide up-to-date information. Many watershed-based community groups use locally based community access servers, free of charge, to maintain their webpage with minimal costs. Minimal costs include a staff person to create and maintain the webpage and webpage software.

3. Listserves

Are computer based electronic mail discussions where all the people who want to be involved will receive updates about events and issues. Listserves provide a forum for discussion, easily connecting all the concerned parties at their convenience.

4. Newsletters

Newsletters are much like websites in that they relay information to a broad range of people. However, newsletters are not as up-to-date as a well-maintained webpage and newsletters are more costly, involving the costs of development, printing, mailing lists, and postage. Another effective use of newsletters is using newsletters of other organizations. A small

add or information can be placed in another organization's newsletter to inform a broader public of the watershed initiative and activities This can usually be done for free, through partnering, or for a minimal cost.

5. Letters

Direct letters mailed to the homes and businesses within a targeted watershed provide an excellent means of directly informing the public of an initiative and upcoming activities. Of course, individual letter mailings can be time consuming and costly.

6. Information Campaigns

Information campaigns can take on many forms to flood the public with information about their watershed or upcoming meetings and activities. These campaigns can proceed with the assistance of flyers, brochures, posters, newspaper articles, radio advertisements, public service announcements, television advertisements, television news stories, billboards, etc An extensive campaign can require significant time and money investment.

7. Media Relations

Media relations, much like information campaigns, require the use of newspaper, television, and radio to educate and motivate the public about watershed issues and upcoming activities. Personal advertisements can be costly Newspaper articles, news stories, and radio show interviews are cost-free methods to inform the public through the media.

8. Guidebook, Handbook, Resource Guide

Several groups in the literature and in the surveys have developed watershed guides that go beyond the scope of a brochure or pamphlet. These guides provide data about the watershed and tools and contacts to address these issues. They act as empowering educational material and are said to have very positive results.

9. Opinion Surveys

Surveys can be an excellent way to define the public and to elicit public views. Surveys can be applied by phone, mail, electronic mail, or face-to-face. The development and administration of a survey can be costly and time consuming, but are often an excellent starting point for a watershed initiative.

The sources for the above listed mechanisms include: EPA Top Ten Watershed Lessons Learned, Getting to Know Your Local Watershed: A Guide for Watershed Partnerships, Purdue's Know Your Watershed Website, Neuse River Water Quality Model, River Network, Tennessee Valley Authority, and the survey studies summarized in the appendix.

## Defining Success and Failure

Defining success in terms of public participation is not an easy task. The participation guidelines and results from the surveys regarding effectiveness were analyzed for commonalties. Upon examination of the indicators of success, four common themes emerged. The processes or projects were deemed successful because they were efficient, equitable, durable, and/or acceptable.

### Successful Public Participation Guidelines

River Network, a national non-profit group seeking to strengthen watershed efforts, have discussed several reasons why and how people should be involved in watershed planning. Two of the key points they discuss are a lack of knowledge or misinformation and an ever-growing population. Because the population is growing rapidly people need to be aware of the demands humans make of the land and realize that human land use, how and where, has significant impacts on all resources. Their recommended course of action is education. Through education people will become aware of the issues and be motivated to address the issues. "If people know the

pollution source, they are likely to do something about it" (River Network 1999). Methods that motivate people to participate, such as personal impact and ownership, where listed in the previous section on participation. This section will identify the superior methods to assure successful participation

Some literature exists describing measures that may prove useful in avoiding or minimizing the challenges of watershed planning in order to maximize the benefits of the process. The Environmental Protection Agency has developed "Top 10 Watershed Lessons Learned" as a guide for practitioners and managers. This guide lists ten lessons as keys to making a watershed partnership successful.

In addition, other individuals and groups such as the Western Governors' Association, Western States Water Council, Purdue University's Know Your Watershed Website, Texas Institute for Applied Environmental Research, Chris Brown of the National Park Service, Don Elder of American Rivers, Steve Born of the Black Earth Creek Watershed in Wisconsin, Tennessee Valley Authority River Action Teams, and many more have developed and published guidelines for effective partnerships in watershed approaches. Below, the EPA guidelines for successful watershed planning serve as a framework to further account for guidelines developed by agencies, groups, and individuals.

1. Have clear visions, goals, and action items:

"The best visions are graphic in their descriptions and relate to human experience" (EPA 1997). The Patuxent River Watershed is a good example where a state senator stood in the water and said, "I want to be able to see my feet" (Bernie Fowler, former Maryland State Senator 1997). This is an example of a vision that is very clear and tangible. It is a vision that the general public can easily identify with without the confusion of technical data about erosion, turbidity, and sedimentation. Often times groups will hold open facilitated workshop sessions to establish a vision, goals, and objectives.

Another example of a clear vision that the public can relate to comes from the Tampa Bay National Estuary Program. The goal of this project was to decrease nutrient loading that was causing eutrophication and excessive algal blooms, which caused numerous detrimental ecosystem impacts. The technical scientific goal of reducing nutrient loading was difficult to identify with in lay terms. However, as a result of increased nutrients sea grasses were dying. The group set the recovery of sea grass beds as a tangible and easily identifiable goal that people could readily understand. (EPA 1997)

The Western Governors Association states that as threats become more tangible and systems, or watersheds, produce less aesthetic, economic, cultural, recreational, and /or environmental profits than they had previously, a broader range of people within communities feel the impacts. If the public cannot easily understand and relate to a problem it is not likely that they will want to become or stay involved in the process Problems need to be presented in an easily comprehensible manner.

2. Have good leaders who are committed and empower others:

Traditionally, government agencies have taken the lead on water management projects. As noted in the literature review these top-down driven processes did little to include the public, other than the loudest or richest voices. The modern approach calls for strong leaders, but not necessarily government leaders or people who control the process In fact, the modern approach is very different from the traditional approach where experts, such as scientists and engineers, figure out the problems and tell the people what needs to be done Today's approach calls for the experts to work with people to find out what they believe the problems to be. The experts provide their consultation and resources as support to the group's effort. Perhaps Getches said it best when he stated of the modern approach that "government should be on the bus, not driving it" (Getches 1998). So, who should be driving the bus? It is best if a leader emerges from the community or for a board of community members to make the key decisions of a watershed

group. A leader should be just that, not a decision-maker, as the decisions should come from the group itself. However, as stated by Dwight Siemiaczko of the Lower Paint Creek Association in West Virginia, government support is crucial for financial and technical support. While the government should not lead the process they, as does everyone, have a strong role in the success of watershed planning. "No one can do the job alone" (Dwight Siemiaczko).

3. Have a coordinator at the watershed level:

It is important to have a coordinator at the watershed level because this person is most likely to be aware of the issues within the watershed first hand. Also, this person will serve as the facilitator to centralize, coordinate, and organize watershed efforts. In terms of participation, this person should be someone who is familiar and trust-worthy within the community This will help encourage substantive participation and foster partnerships and trust "Communities are rebuilding and rediscovering themselves through inclusive processes around river systems as focal points and sources of community pride" (WGA 1994)

4. Make environmental, social, and economic goals compatible

Sustainable development is balancing the three legs of the land use stool: economic, social, and environmental legs (Kaiser, Godschalk, and Chapin 1995). This concept of sustainability needs to be remembered in making watershed planning successful. If the environmental and economic goals are completely incompatible, it's not likely environmental goals will be supported by the public (EPA 1997). An assessment of individual watershed aspects with respect to environmental, social, and economic factors should be conducted to understand the watershed environment. It is difficult to seek a balance without an understanding of where each of these legs is.

In respect to public participation, people are not likely to be involved in a watershed planning process if it does not appear to be compatible with their economic and social goals. A local example is that of the Pigeon River which has problems with flooding and pollution from

septic systems, runoff, and development (303(d) Report 1999). Business owners may care very little about protecting these water resources unless they realize that by doing so they protect their businesses, homes, and economic future.

5. Plans only succeed if implemented

EPA says that the "greatest challenge with watershed planning is making sure that the plans are implemented and that the plan does not sit on a shelf gathering dust in some office." They say that charging a group with responsibility of implementation and making sure the projects are broken down to a manageable size are key to implementation. Other groups state the key to implementation is broad public involvement from the beginning and throughout the project. This decreases the chance that someone will be resistant to the project and increases the likelihood that people in the community will take ownership of the project and see that it is implemented and maintained.

6. Establish partnerships

The importance of strong partnerships was outlined earlier in the literature review of this thesis. "Partnerships are key to the success of watershed approaches." Perhaps partnerships should be listed first, as this appears to be the lifeline of all watershed approaches. Again, figure 3 shows the importance of stakeholder involvement in the modern watershed management process. EPA says the same about partnerships as the rest of the literature. Partnerships should include anyone and everyone that has an interest in the watershed And, as previously stated there are many benefits of these partnerships: increased credibility, increased strength, increased durability, reduced duplicate efforts, best application of limited funds, increase acceptance, and increased likelihood of implementation.

7. Use good tools

The watershed approach framework held by EPA and shared by numerous group approaches also supports this recommendation. Using good tools is much the same as sound

management techniques These techniques include workshops, guides, Internet sites, geographic information systems, monitoring, modeling, etc. Many of these techniques may be expensive or difficult to obtain and/or understand and operate The success of these tools is often fueled by public participation and partnerships where people and different groups lend their time and support to develop and apply these tools

8. Measure, communicate, and account for progress

Any project should have a mechanism in place to measure and account for success. Reports should be made to those involved in the project to keep the participants interested by seeing that their work is making a difference. Reporting of progress not only keeps those involved interested but may also stimulate others in the public to become involved. Wayne Poppe of TVA stated "that no matter how good we are at data collection and reporting, we ultimately miss the mark if we fail to provide this interaction with the river's users" (EPA 1997). Small successes and milestones can be celebrated in a newsletter, on a website, via email reports, or with informal gatherings.

9.Education and involvement drive action

Education is an essential first step in the formation of a watershed association. This process aids in increasing public awareness and involvement in the process. The mechanisms for education and involvement are numerous, as listed previously in this chapter. EPA has stated in "Top 10 lessons learned" that communication is likely to be more effective if it is initiated by a community member or a neutral party, rather than a government official.

Many groups may view establishment of educational programs as success, but it is important to view education as a means and not an end Education should act as a building block for a successful process, as further discussed in guideline 10 It is through education that on the ground changes, including changes in legislation and land use, are likely to occur (Getches 1998).

10. Build on small successes

This is much the same as accounting for progress and celebrating success. Only this guideline takes the celebration one step further hoping that small successes will lead to greater involvement, support, and success of future and larger projects. A common example is that of demonstration projects within watersheds, like a stream bank restoration project that is highly visible to the public. The demonstration projects should be meaningful to the community and serve as a focus for other efforts to occur.

Further emphasis should be placed on starting small. All the problems in a large watershed cannot be tackled at once. A manageable issue of manageable size should first be addressed. It is likely that other successful projects will grow from this small project. This process does not always yield immediate results, but takes time, commitment, and patience to reap the rewards.

11. Government should not lead the process

This is a lesson touched on by the EPA *Top Ten Watershed Lessons Learned*, but is not one that is explicitly stated. The Oklahoma State Conservation Commission stated that in future watershed efforts "the State will not take on the role of facilitator/moderator at the meetings" (EPA 1997). This was said because they realized their vision was not accepted at the local level, and that the vision only worked when the local community was able to develop their own vision and address it with the assistance of the government agency's funding and resources. Another example is that of a local watershed planning process conducted in East Tennessee by TVA. When TVA tried to facilitate the process the people replied with, "Well, you're the experts. You tell us what the problems are" (personal conversation with local participants 1999). As Getches said, "The government should be on the bus, not driving it" However, it should be emphasized that the government, as does everybody, has a very important role in the watershed approach.

Applying the ten lessons learned, and the guidelines developed by other groups and agencies, does not necessarily guarantee success, but with out these lessons success will certainly be more difficult to obtain. Also, the roles of public participation within these lessons learned are critical, calling for a greater understanding of public participation in regards to successful watershed projects By effectively involving the public partnerships should develop that result in; "more efficient use of financial resources, a spirit of sharing and cooperation, fairness which minimizes the potential for negative social impacts, and more creative and acceptable ways to protect natural resources" (CTIC 1998).

### Indicators of Failure

As discussed in the literature review, Chapter 2, on the history of water resources planning the historical approaches may be viewed as failures because they those attributes which are found in the success guidelines. The single-agency top down driven processes did not have a great deal of acceptance and equity, resulting in a consequent lack of efficiency and durability.

## Survey Results

Table 2 is a summary of the characteristics of each of the watershed groups participating in the survey. Additionally, summaries of each of the ten watershed groups participating in the survey are located in Appendix A. Copies of the surveys, phase I and phase II, and the results from the surveys are in Appendix B and C of this report

### Phase I Survey

The preliminary survey investigated watershed groups to determine the participants and the mechanisms for involvement The results from the phase I survey are presented in Table 3.

## Table 2. Major Attributes of Watershed Groups

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Location** | Northwest | Midwest | Northeast | Northeast | Northeast | Northeast | Northwest | Southwest | Northeast | Southwest |
| **State(s)** | Montana | Kansas | Vermont | New York | Michigan | Michigan | Washington | Arizona | New York | Colorado |
| | | | New York | Connecticut | | | | New Mexico | | |
| **County(ies)** | Fergus | Reno | Franklin | 7 Townships | 7 Counties | 20 Counties | Whatcom | | Dutchess | |
| | | Kingman | Essex | | | | | | | |
| | | Pratt | Clinton | | | | | | | |
| | | Stafford | Washington | | | | | | | |
| **Watershed Size (acres)** | 255,000 | 633,000 | 1,960,000 | 40,000 | 581,120 | 556,800 | 33,000 | 17,280,000 | 134,400 | |
| **Year Initiated** | 1994 | 1992 | 1990 | 1996 | 1965 | 1996 | 1998 | | 1995 | |
| **Lead Agency** | State Gvt. | State Gvt. | | | State Gvt. | | Grassroots | Tribal Gvt. | | |
| | | County Gvt. | | | | | | Local Gvt. | | |
| **Meeting Frequency** | Quarterly | Monthly | As Needed | | Varies | Twice Yearly | Weekly | | Monthly | Monthly |
| **Dominant Land Use** | Agriculture | Agriculture | Agriculture | Urban | Urbanizing | Agriculture | Forestry | Gvt. | Forestry | Mining History |
| Agriculture | 68% | 98% | 16% | | | 46% | | | 35% | |
| Forestry | 27% | 0% | 67% | | | 29% | 75% | | 45% | |
| Urban | 5% | 1% | 6% | | | 8% | | | 15% | |
| Other | 0% | | 0.11 | | | 17% | | | 5% Mining | |
| **Water Uses** | | | | | | | | | | |
| Drinking Water | x | x | x | x | x | x | x | | | |
| Recreation | x | x | x | x | x | x | x | | x | x |
| Fisheries | x | x | x | x | x | x | x | | x | |
| Hydroelectric | | | x | | x | | | | x | |
| Flood Retention | x | | x | | | x | | x | x | |
| Navigation | | | x | x | | x | x | | | |
| Irrigation | x | | x | | | x | | | x | |
| Wildlife Habitat | x | x | x | x | x | x | x | | x | x |
| **Stressors** | | | | | | | | | | |
| Bacteria | | | x | x | | x | x | | x | |
| Biological Oxygen Demand | | | x | x | | x | x | | x | |
| Heavy Metals | | | x | | | | x | | | x |
| Nutrient Loading | x | x | x | x | x | x | x | | x | |
| Sediment | x | x | x | | | x | x | x | x | |
| Odor | | x | | | | x | x | | | |
| Turbidity | x | | x | | | x | x | | x | |
| Toxic Substances | | | x | | | x | x | | | x |
| Flooding | x | | x | x | | x | | x | x | |
| Exotic Species | x | | x | x | x | | | x | x | |
| Altered Instream Flows | | | x | | x | | | x | | |
| Pathogens | | | x | | | | x | | | |

## Table 2. Continued

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Urban Runoff | x | | x | x | x | x | x | | x | |
| **Project Focus** | | | | | | | | | | |
| Abandoned Wells | x | | | | | | | | | |
| Mines | | | | | | | | | | x |
| Dams | x | | x | | | | | | x | |
| Channelization | x | | | | | x | | x | | |
| Agricultural Practices | x | x | x | | | x | | | x | |
| Septic & Storage Tanks | x | x | x | x | x | | x | | x | |
| Riparian Areas | x | | x | x | x | x | x | | x | |
| Streambanks | x | x | x | x | x | x | x | x | x | |
| Urban Runoff | x | | x | x | x | x | x | | x | |
| Acid Rain | | | x | | | | | | | |
| Animal Manure | x | | x | | | | | | x | |
| Landfill | | | | | | x | | | | |
| Logging | x | | x | | | | x | | | |
| **Goal Established** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| By Consensus? | | Yes | Yes | | | Yes | | | Yes | |
| **Accomplishments** | | | | | | | | | | |
| Educational Program | x | | x | x | x | x | x | | x | x |
| BMP Installation | x | x | | | | | | | | |
| Restoration Projects | x | | | | | x | | | | |
| Community Growth Mgmt | x | | | | | | | | | |
| Management Systems | | x | | | | | | | | |
| Monitoring Program | | | x | | | | | | x | |
| Influence Legislation | | | | x | x | | x | | | |

**Table 3. Survey Phase I Results**

| Question | Watershed Initiative # | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total | Percentage |
| | | | | | | | | | | | | |
| ***Who are the primary participants in your watershed initiative? (n=10)** | | | | | | | | | | | | |
| Individuals | x | x | x | x | x | x | x | x | x | x | 10 | 100 |
| Agencies | x | x | x | | x | x | | x | x | x | 8 | 80 |
| Business/Industry | x | | x | | x | x | | x | x | x | 7 | 70 |
| Organizations | x | x | x | | | x | | x | x | x | 7 | 70 |
| Other | x | x | x | | x | | | | | | 4 | 40 |
| | | | | | | | | | | | | |
| ***What method or process has been used to solicit public input? (n=10)** | | | | | | | | | | | | |
| Newsletters & Other Publications | x | x | x | x | x | | x | x | x | x | 9 | 90 |
| Presentations to Schools and other organizations | x | x | x | x | x | x | x | x | x | x | 10 | 100 |
| Public Meetings | x | x | x | x | x | | x | x | x | x | 9 | 90 |
| Websites | | x | x | x | x | x | x | x | x | x | 9 | 90 |
| Interactive Workshops - Focus Groups | x | x | | x | x | | x | x | x | x | 8 | 80 |
| Email | | | | | x | x | x | x | x | x | 6 | 60 |
| Television - Radio Advertisements & Public Service Announcements | | | x | x | x | | | x | | x | 5 | 50 |
| Watershed Booklet - Listing all resource contacts | x | | | | | | | | | | 1 | 10 |
| Tours | x | | | | | | | | | | 1 | 10 |
| Newspaper Articles | x | | | | | | | | | x | 2 | 20 |
| Encourage city council mtg attendance | x | | | | | | | | | | 1 | 10 |
| Encourage letters to local officials | x | | | | | | | | | | 1 | 10 |
| Encourage letters to newspaper editors | x | | | | | | | | | | 1 | 10 |
| "Good Neighbor Watch" of Stream Resources | x | | | | | | | | | | 1 | 10 |
| Other organization newsletters | | | | x | | | | | | | 1 | 10 |
| Symposiums | | | | | | | | | | x | 1 | 10 |
| Personal Calls | | x | | | | | | | | | 1 | 10 |
| Personal Recruitment | | x | | | | | | | | | 1 | 10 |
| Signs | | x | | | | | | | | | 1 | 10 |
| Roundtable | | | | | x | | | | | | 1 | 10 |
| Festival | | | | | x | | | | | | 1 | 10 |
| Virtual Chat Sessions | | | | | | | | | | | 0 | 0 |

Ten of the twenty-seven recipient organizations responded, yielding a response rate of 37 percent. A copy of the phase I email survey is in appendix B.

Question #1: Who are the primary participants in your watershed initiative?

A majority of the participants in each project appear to be representatives of federal, state, or local agencies. One watershed group directly stated that a majority of the involvement comes from government agencies.

Question #2: Have you involved the public in your watershed initiative?

It is interesting to note that 100 percent of the watershed initiative groups stated that they have involved the public in their planning process. One group stated that they only recently expanded their project to involve the public in the process. Another group stated "I think that we have adequate public involvement in our watershed initiative. However, we are constantly attempting to get more public involvement."

Question #3: What method(s) or process(es) has been used to solicit public input for the watershed initiative?

This question resulted in an extensive list of mechanisms to involve the public, as summarized in Table 1. 100 percent of the groups stated that they use newsletters and other publications and presentations to schools and other organizations to solicit public involvement. 90 percent of the groups stated that they use public meetings as a means of involvement. 80 percent of the groups stated that they use interactive workshops and focus groups. 80 percent also utilized websites to solicit involvement. One-half and the respondents utilize multimedia, such as radio and television advertisements to involve the public in the watershed initiatives Refer to Table 3 for a comprehensive list of the results ranked by percentage.

Question #4: Have you found these method(s) to be effective (i.e. have they helped you achieve your project goals)?

100 percent of the organizations responding to the survey felt as if their mechanisms for public involvement have been effective in helping them achieve their project goals, indicating a successful process. One organization stated that "project works have accelerated due to increased participation."

All of the ten responding organizations said they would be willing to offer more information and would be happy to participate in future surveys.

Also, it is engaging to note that all of the watershed initiatives were reactionary in nature, rather than proactive. This is not to say that none of the initiatives have proactive goals, but to recognize reactive measures initiated each watershed groups formation.

## Phase II Survey

The results from phase II of the survey were not as easy to quantify, or place into a table for comparison, as those in phase I. Only 7 of the 10 participating organizations that answered phase I answered phase II. This yielded a phase II response rate of 70 percent Below is a discussion of the answers given by each organization. The results from these groups are further utilized and discussed in Chapter 5.0 of this thesis.

Group #1: used public involvement to prioritize watershed problems, establish educational programs, to increase community awareness, enforce existing laws, and major watershed improvement projects. The organization stated that public involvement was very useful in every one of these accomplishments. Additionally the respondent recommended Nominal Group Processes as a mechanism to involve the public. Also, diverse partnerships ranging from individual to government were present in the success of each of the mentioned projects

Group #2: used public involvement to prioritize the watershed issues. Being an agricultural watershed, their main concern fell on cost-share programs with farms. They utilized

input and feedback from farmers to determine programs, incentives, and payment methods. This has helped them work with the stakeholders to determine which issues to address first.

Group #3: stated that public involvement has helped them in every way listed by the survey. It has helped prioritize watershed problems, establish educational programs, create public awareness, facilitate the establishment of new laws, influence better enforcement of existing laws, watershed improvement, and increase financial support. Public participation and input was most useful at the beginning of the planning process. The process is now two years old and the public involvement has tapered off. However, citizen advisory committees (CACs) were formed to provide feedback for reevaluation and reprioritization and to determine if there are evolving issues that should be addressed. The CAC and other public input prioritize education as most important. Consequently, they developed a resource book for educators, along with other educational programs. Public input has also helped determine new guidelines for fishing licenses and to set new regulations for BMPs. Public input has resulted in ecological improvements in this watershed.

Group #4: This group also used public input in every way listed on the survey. Again, public involvement for prioritization was cited as very useful with a NGP-type process being employed, with a break down into subcommittees at the end of the process. An education committee was formed that sent out a public survey and attended public functions to gauge and inform everyone of happenings in the watershed. Sub-committees reviewed laws in the towns and made recommendations Also, municipal officials were present on the committees facilitating coordination with the towns that signed pledges to endorse the final watershed action plan. Watershed improvements have occurred through restoration. This group has included the public from the very beginning of their planning process and cite public involvement from the very beginning as "VERY USEFUL!" They have experienced a greater sense of ownership and support of the process and projects.

Group #5: did not respond to phase II of the survey.

Group #6: did not respond to phase II of the survey.

Group #7: is the only group that did not use public involvement to prioritize the issues Their watershed group formed in response to one specific problem; therefore, they did not see public involvement as playing a role in prioritization. Their main objective was to develop an awareness plan and influence people to influence the decision-makers to adopt specific land-uses ordinances developed by the group. They also stated that this was to better enforce old goals that had been ignored by city and county governments. They used public input to develop the ordinance that they have recommended Also, they held meetings to inform the community about the need for the ordinance.

Group #8: did not respond to Phase II of the survey.

Group #9. stated that they used public input to accomplish all of the things listed in the survey, except changing legislation They stated that public involvement was crucial in prioritizing issues and that this resulted in a watershed planning committee that is completely voluntary. Additionally they stated that "for any management plan to be successful public awareness is extremely important." They have not tried to influence a change in laws because it is a "sticky situation." Instead they have supported voluntary programs and BMPs which are more easily implemented with public support, because it is the public applying these voluntary measures. While they haven't changed any laws, the public's increased awareness has helped with recognition and reporting of issues that need to be addressed by the locally understaffed State Department of Environmental Conservation Their watershed improvement has come in the form of creek cleanups, not any significant environmental improvements.

Group #10 responded to the survey stating that they used public input to achieve every option on the survey, except to establish a K-12 education program. The respondent did not

elaborate on the results, except to say that public input had been somewhat to very useful in each of these instances.

# CHAPTER FIVE

# DISCUSSION AND RECOMMENDATIONS

Based on the surveys and the literature review, criteria that definitively proves whether a watershed approach is or is not successful are difficult to discern. Each watershed is unique and so are the issues, therefore, a "one size fits all" criterian or solution does not apply. As determined in Chapter 4 0 success may be defined in terms of public participation, as a more acceptable, equitable, efficient,, and/or durable project and/or process. Conversely, failure is a project and/or process that is not acceptable, equitable, efficient, and/or durable. Additionally, planning is a continual process often making it difficult to evaluate if a process has or hasn't been successful until many years after commencement. To address this assessment enigma an evaluation matrix, or "Watershed Approach Report Card," (Table 4) has been developed to determine the potential and occurring successes of both fledgling and mature watershed approaches. This report card was developed based on the literature review in Chapter 2 and the recommended guidelines, case studies, and surveys in Chapter 4 to minimize the challenges and maximize the benefits of watershed planning The remaining research questions facilitated the development of the report card and may be ansered by using the report card as a diagnostic tool. The remaining questions are:

1) What are the long-term indicators of a successful process?

2) What are the short-term indicators of a successful process?

3) What are the best methods to involve the public?

## Table 4. Watershed Approach Report Card

| Criteria | Values | Indicators | *Success | **Failure |
|---|---|---|---|---|
| **Acceptability** | **Social** | 1 Public Support | ↑ | ↓ |
| | | 2 Political Support | ↑ | ↓ |
| | | 3 Agency Support | ↑ | ↓ |
| | | 4 Continuous Feedback | ↑ | ↓ |
| | | 5 Passive Mechanisms Applied | ↑ | ↓ |
| | | 6 Active Mechanisms Applied | ↑ | ↓ |
| | | 7 Primary Input Heard & Understood | ↑ | ↓ |
| | | 8 Input Treated as Meaningful | ↑ | ↓ |
| | | 9 Opportunity for project ownership | ↑ | ↓ |
| | | 10 Community or Neutral Facilitator | ↑ | ↓ |
| | | 11 Start Small w/Issues of Manageable Size | ↑ | ↓ |
| | | 12 Report & Celebrate Success | ↑ | ↓ |
| | | 13 Substantive Involvement | ↑ | ↓ |
| **Equity** | **Social** | 14 Comprehensive Stakeholder Inclusion | ↑ | ↓ |
| | | 15 Diverse Partnerships Formed | ↑ | ↓ |
| | | 16 Vision by Consensus | ↑ | ↓ |
| | | 17 Non-technical Communication | ↑ | ↓ |
| | | 18 Widespread Participation | ↑ | ↓ |
| | | 19 Good Meeting Etiquette | ↑ | ↓ |
| | **Economic** | 20 Cost-Sharing | ↑ | ↓ |
| | | 21 Multi-Partners | ↑ | ↓ |
| **Efficiency** | **Social** | 22 Sound Leadership | ↑ | ↓ |
| | | 23 Conflict | ↓ | ↑ |
| | | 24 Tangible Goals | ↑ | ↓ |
| | | 25 Prioritization | ↑ | ↓ |
| | | 26 Workload | ↓ | ↑ |
| | | 27 Work Quality | ↑ | ↓ |
| | | 28 Define & Measure Success | ↑ | ↓ |
| | **Economic** | 29 Goals w/minimal investment | ↑ | ↓ |
| | **Environmental** | 30 Degree of Desired Condition | ↑ | ↓ |
| | | 31 Index of Biotic Integrity (IBI) Scores | ↑ | ↓ |
| | | 32 BMPs properly utilized | ↑ | ↓ |
| | | 33 Turbidity | ↓ | ↑ |
| | | 34 Dissolved Oxygen (DO) | ↑ | ↓ |
| | | 35 Stream Bank Assessment | ↑ | ↓ |
| | | 36 Size of Riparian Corridor | ↑ | ↓ |
| | | 37 Length stream / river restored | ↑ | ↓ |
| **Durability** | **Social** | 38 Conflict | ↓ | ↑ |
| | | 39 Clear Vision, Goals, Objectives | ↑ | ↓ |
| | | 40 Time Investment | ↓ | ↑ |
| | | 41 Community Participants | ↑ | ↓ |
| | | 42 Change in legislation | ↑ | ↓ |
| | | 43 Stable Structure | ↑ | ↓ |
| | | 44 Flexible Process | ↑ | ↓ |
| | **Economic** | 45 Maintenance | ↓ | ↑ |
| | | 46 Stable Funding Sources | ↑ | ↓ |
| | | 47 Adequate Funding | ↑ | ↓ |
| | **Environmental** | 48 Sustained Desired Condition | ↑ | ↓ |

*Success = Maximization of process or project benefits due to an increase in, or presence of acceptance, equity, efficiency, and/or durability
**Failure = Minimization of process or project benefits due to a decrease in, or lack of acceptibility, equity, efficiency, and/or durability

# Watershed Approach Report Card

Table 4, aids in the evaluation of present and future successes and potential failures of groups engaging in a watershed approach process. Also, it aids in guiding groups towards a successful process, by gauging where they are in the process and what they need to do.

## Indicators of Successful Participation

### Criteria

According to the definitions of success and failure, criteria were developed to evaluate watershed processes and projects. These criteria are acceptibility, equity, efficiency, and durability The criteria are ranked in chronological order. Acceptibility is first because acceptibility usually needs to be established before the other criteria can be developed. The same applies for equity and efficiency. Also, within each principle are indicator values. As with the criteria they are ranked chronologically with social values listed first as the others likely cannot occur without these values are first established. Also, the social and economic indicators tend to be process driven while the environmental indicators are more outcome driven.

### Short-term Success

The social indicators listed towards the beginning Table 4 apply to processes that are at the beginning stage or very young, generally 0 to 3 years. This time frame is applied because it is generally difficult to make any quantitative measures of success, especially in economic and environmental values within this time period. Economic and environmental indicators usually need to express a degree of sustainability to be deemed successful. When using the Report Card, the social indicators are most applicable to evaluating shot-term processes, but will likely be present in long-term successes.

## Long-term Successes

The indicators listed towards the end of Table 4 generally apply to planning processes that are mature, ongoing for three years or more. This time frame is generally applied because this is the amount of time that must pass in ecological, economic, and social systems to indicate that a significant quantitative change has taken place.

## Report Card Grading and Effectiveness

The report card is easy to use. Read each indicator and determine if your process or project includes the indicator. Obviously, the greater the degree to which the indicator is met the greater the likelihood of success, and the less the indicator is met the greater the likelihood of failure. The table was constructed with short-term indicators, mostly social, towards the top of the table and long-term towards the bottom Therefore, your process may not have all the indicators, especially as you reach the bottom of the table. Recognizing the difficulty in evaluating effectiveness and the continuity of the planning process, the report card should be revisited frequently. Early in the process short-term indicators can be utilized to determine the likelihood of success. As the process or project matures, long-term indicators should be utilized If your process is older than three years and has not moved into the long-term indicators, economic and environmental values, the process may need to be reevaluated and restructured Often times, there may be tradeoffs that make a process more successful. More time may be invested, but because of this more people may support the process and projects will be more easily implemented and supported with increased durability. Additionally, one successful indicator may not always indicate success. It is a combination of success indicators, such as miles of streambank restored and durability of that restoration project, that together indicates success. Again, the indicators are unique to each watershed initiative

## Evaluation Principles

Each principle developed as a standard for success and/or failure from the literature review and case studies. They are listed in the table according to a descending degree of priority. As you descend the table each principle depends on the one before. For example, durability is not likely to exist without acceptance and equity. Below is a description of the indicators:

**Acceptability**

1. Public support stems from public inclusion from the beginning of the process, along with other factors. As stated by Thomas and Plumlee, groups or individuals that are not involved from the beginning of the process may feel slighted and later come to negatively affect the outcome of the planning process by opposing the implementation of projects or policy.

2. Political Support is important to assure that the communities needs are heard and responded to by local, state, and federal governments that are vital in supporting projects and passing legislation. It is important to understand the general dynamics of local politics so that a watershed group will understand whom they should or can work with and what issues are most feasible to act as starting points.

3 Agency Support is vital for technical assistance, organization, and funding

4 Continuous Feedback keeps the lines of communication open facilitating establishment of trust and partnerships. At the beginning of a process it may take awhile for accomplishments to emerge from the public meetings. During this delay, or starting-up period it is important to have activities and or reports that keep the group motivated and involved to produce tangible accomplishments.

5 Passive Mechanisms Applied: These are the involvement mechanisms as described in Chapter 4.0 and found in Table 1. They are useful in soliciting involvement Passive mechanisms

are more of an educational and informative form of participation, with little to no direct interaction. However, passive mechanisms are still highly important.

6. Active mechanisms applied: These mechanisms were also described in Chapter 4 and Table 1 and work to solicit involvement Active mechanisms involve interaction and action from the participants, often leading to on-the-ground changes.

7. Primary input heard and understood: As demonstrated by the Peacheater Creek Watershed in Oklahoma, the process would have proceeded faster and with less conflict if the Oklahoma State Conservation Commission had a primary understanding of the local community's perceptions of and concerns for the water resources. (EPA 1997) 8 Public Input Treated as Meaningful: People respond well and are more likely to be and remain involved when they realize that they do have a voice and are likely to have a stake or ownership of the process results. (WGA 1994) Just hearing the public is important. Even the most bizarre or seemingly conflicting input can prove useful in a planning process, as all of the alternatives are weighed.

9. Opportunity for Project Ownership: As previously stated, people are more likely to become and/or stay involved in a process if they feel that they are likely to have ownership of the project.

10. Have Community or Neutral Facilitator: This method has been recognized by many government agencies that were working to establish watershed groups, or to address issues on a watershed level. The public responds best when the process is led by a neutral party, rather than government, and in some instances better when it is a member of their community that they trust.

11. Start Small w/Issues of Manageable Size Referring back to the scale of focus, it may not be possible to address every issue in a watershed, especially large watersheds. Issues should focus on feasibly sized issue and proceed building on the smaller successes. In such instances, a sub-watershed approach may be more useful.

12. Report and Celebrate Success People respond well when they feel informed and motivated when successes are celebrated.

13. Involvement is Substantive (not symbolic): The public needs to know that they have control of the process and that their input and action is what determines the outcomes Symbolic public involvement should not be employed or stated simply to fulfill the requirements of a grant. This is contrary to traditional participation where the public has felt as if their participation had no impact on the process.

**Equity**

14. Comprehensive Stakeholder Inclusion: This refers to the importance of having everyone involved in the process, not just the general public. As stated by Getches and several others it is of vital importance to have everyone involved, public and government groups and orgainzations

15 Diverse Partnerships Formed: Bringing together individuals and/or representatives of different groups greatly benefits a process. Much like stakeholder inclusion, anyone and everyone that has an interest in the watershed should be involved. These partnerships lead to success by bringing people togeher who can fill different roles and combine their efforts, while decreasing the likelihood of duplicative efforts.

16. Vision by Consensus: As demonstrated by the Patuxent River Watershed people are more likely to work on an issue if they have a clear understanding of what the issue is and if everyone agrees that it is an issue worthy of being addressed

17 Non-Technical Communication: The Tampa Bay Estuary Program is an example of how non-technical communication is positively used. Most of the general public could not easily understand nutrient loading and hyper-eutrophication, but they could understand that pollutants were causing the seagrasses to die. As stated previously in the text, sometimes the scientific and

technical terminology is beyond the scope of what the general public relates to. When people cannot understand the issues, they are not likely to become involved.

18. Widespread Participation insures a greater degree of equity, as everyone should be involved ensuring that no one is discriminated against racially, finacially, or socially and left out of the process.

19 Good Meeting Etiquette Utilized Numerous groups have stated that meetings and other activities need to be announced well in advance and held at times and in places that are convenient to the public. Also, it is preferred to hold these meetings on neutral ground.

20. Cost-sharing assures that one person or organization does not carry the entire economic burden of the project or process. Partners should be able to equitabliy contribute resources.

21. Multi-Partners. This approach assures that everyone has an opportunity to contribute to and thus share the benefits of the project This partnering support can be in-kind or financial contributions.

**Efficiency**

22. Sound Leadership It is important for the public to have someone leading the process that is easy to contact and will keep the process moving in the right direction.

23. Conflict: Inter and Intra agency and group conflict concerning stakeholders that should be working together on watershed projects can certainly delay progress.

24. Tangible Goals: Much like a clear vision, it is best when people can easily and readily understand what the goals of the project are, and what steps are necessary to achieve the goals.

25. Prioritization is an important component of efficiency. Prioritization is a method for determining what should or should not be done, what the steps are, and the sequence The basis

for prioritization varies based on the issues and needs within the watershed. Some common prioritization criteria may include urgency and "doability."

26. Workload impacts efficiency If each person or partner has less of a workload, they are more likely to achieve more and stay committed, rather than burning out.

27. Work Quality. The higher the quality of work contributed, the greater the efficiency and likelihood of durability.

28. Define and Measure Success: The public needs to stay well informed about the process. People generally respond best when they are aware of the issues Also, people tend to be motivated by success, when they see that their efforts are worthwhile.

29. Goals with minimal investment: Plan wisely and invest and partner wisely to assure that the funds will achieve the intended goals

30 Degree of Desired Condition. For example, if the IBI scores are greatly increased that would be a greater success than if they were only marginally increased. This applies to the other biological parameters as well.

31 Index of Biotic Integrity (IBI) Scores may indicate an improved or diminishing ecological condition.

32 BMPs properly utilized may mitigate or alleviate negative impacts on biological systems.

33 Turbidity may indicate an improved or diminishing ecological condition.

34 Dissolved Oxygen (DO) may indicate an improved or diminishing ecological condition.

35 Stream Bank Assessment may indicate an improved or diminishing ecological condition.

36 Size of Riparian Corridor may indicate an improved or diminishing ecological condition.

37. Length stream / river restored may indicate an improved or diminishing ecological condition.

**Durability**

38. Conflicts: As stated in the case of the Illinois River in Oklahoma, "the locals were more interested in water for livestock, while the state was more interested in good water quality"(EPA 1997). The citizens and the agencies were totally split on the issues and nothing was being accomplished. The lesson is that an issue consensus needs to develop before attempting to proceed with the process. If this acceptance is established through joint consensus, it is likely that conflict would be minimized.

39. Clear vision, goals, and objectives lead to an understanding of what the purpose of the project is, something to work towards, and a purpose to celebrate and motivate.

40 Time Investment: Avoid excessive wastes of time. Sometimes more time is invested into certain aspects than appear to be beneficial. This can consume large amounts of volunteer time and/or staff time. The result can be time and money wasted causing public participants and volunteers to drop out of the process.

41 Community Participants have the ability to support and maintain projects on a local level.

42 Change in legislation may indicate implementation of regulations to induce a positive change in the watershed.

43. Stable Structure: The public is not likely to stay involved in a process that is not well organized or that lacks credibility.

44. Flexible Process: A process needs to remain open to new ideas and continually have feedback on the issues to assure or redirect their focus.

45. Maintenance: is an important aspect of durability. If a project requires too much maintenance, or if there is not a well-communicated maintenance plan, an implemented project may fail as time passes.

46. Stable Funding Sources: Some funding sources, for instance grants such as section 319 non-point source pollution grants offered by EPA, require proof of public participation to receive grant moneys. This could result in symbolic representation to qualify for funds.

47 Adequate Funding: Inadequate funding and/or chasing funding that does not match the groups' objectives can cause major problems

48. Sustained desired condition: If the desired outcome is sustainable it is likely that it will last. For example, if a streambank is restored and ecological conditions improve, it should be long-term to be considered a success. If the streambank erodes the next year because other important issues were ignored, the process is not a success

## Recommendations

As previously stated in the literature review, there is no one template for a watershed approach that applies to all watersheds, as each watershed is different However, this report card may be used to evaluate any watershed initiative While each approach should share commonalties in terms of the general framework, each approach must also be unique and flexible to accommodate the specifics of each different watershed. The actions towards successful participation and the indicators of successful participation will vary just as the framework varies between watersheds. However, as with the framework, while different, there will still be commonalties in the actions and indicators

Employ all possible methods to bring people together and break down preconceived notions and barriers that may impede the formation of a partnership. Be creative with the

methods. Subsequent to establishing partnerships and trust, measures should be employed to communicate and to keep all involved individuals informed.

Utilize the report card located in Table 4 to evaluate success and failure indicators and keep the process motivated Also use the report card to determine what measures need to be utilized if the primary evaluation does not indicate likely success.

In terms of gaining participation, many groups recommended researching other groups to see what methods have and have not worked for them. This is what has been done in this study Listed in Table 1, and further explained in Chapter 4.0, is a complete list of the participation mechanisms discussed in the literature and by the watershed groups involved in the surveys. These activities will benefit from the aid of experts and specialists. It is highly recommended that experts be consulted when necessary.

While passive mechanisms of involvement may sound or appear to be unimportant, they can be significant. Oftentimes passive involvement is an important method to develop a broad education program. Education is the first step toward involving people in the process and knowledge often leads to action (River Talk, 1998). Also, it is important to recognize that education is an ongoing process. Much like any step in a planning process, education should be ongoing with feedback and evaluation.

TVA's involvement assessment, discussed in Chapter 4.0, on public involvement, can be useful in determining the best allocation of time and resources. If a large number of people are not aware of the issues, time should be spent on an education campaign. If many people are aware of the issues, less time can be spent on an education campaign to involve those that are uninformed and more time and resources can be spent on planning. However, even if all of the people in a community appear to be aware of the issues an education campaign should still take place to assure that absolutely everyone has a chance to be informed and involved while further clarifying any misconceptions.

As a result of an education campaign, interested people should emerge. The interested parties and individuals that emerge prior to and/or during education outreach, or passive participation, should be encouraged active participation opportunities. The entire community, public and private sector, should be asked what the problems are, not just the government associates. As stated in the literature review, this input process should not be facilitated by a government official, but has potential for greater success if lead by a neutral party. Once the problems have been identified and discussed experts may need to be involved to help clarify the issues. The group should then develop a vision through consensus and establish small tangible goals and objectives and projects to achieve this vision. Schedule these meetings at convenient times in convenient places and to inform everyone well in advance. As the group proceeds on project goals and objectives everyone should stay informed of progress and success. As the process continues feedback, evaluation, and celebration should perpetuate the process. This should lead towards a successful watershed approach that will comprehensively address all the social, environmental, and economic values as a major step towards sustainability for the future.

One problem with this approach is that a majority of groups that form are reactive, assembling in response to a problem. Because of this many groups prioritize objectives by working on the most environmentally degraded areas first. While efforts are made to protect and recover the degraded waters, the non-problem waters are vulnerable to impacts The prioritization dilemma is if time and money would be better spent restoring degraded waters or protecting pristine waters. However, this is beyond the scope of this study Hopefully, educational efforts within a watershed would spread, communicating a message of protection and restoration for all waters of the nation. Perhaps a good solution would be a national water resource education campaign implemented in schools and through the media.

Obviously, good public participation is not all it takes for a watershed approach to be successful. Funding is often key to a groups success, to pay staff time, meeting arrangements,

and to plan and implement projects. Time and skill to develop a watershed plan are also factors that can be limiting to a group's success. Remember that a successful process takes skill time and patience (Purdue CTIC 1998). While other factors can be limiting, it is important to remember that public participation that leads to strong partnerships often increases the potential for more funding and volunteers with time and skills to support the process.

## Conclusion

The watershed approach certainly has the potential to be more successful than previous water resource management processes, by involving the public in a more effective and equitable way. While the indicators of this increased efficacy may be a trade-off, such as time and money The overall outcome in terms of participation leading to increased acceptance, equity, efficiency, and durability appear to be worth the change in approach. In order to assure that all the potential successes of a watershed approach are achieved the Watershed Approach Report Card was developed. Strive for report card success and utilize all methods on the checklist and, in terms of participation, success shall be pre-eminent. While success cannot be guaranteed, fulfilling as many criteria as possible, while being mindful of the failure indicators, will increase the likelihood of a successful watershed approach.

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# APPENDICIES

# APPENDIX A

# WATERSHED GROUP SUMMARIES

# WATERSHED GROUP SUMMARIES

## Animas River Stakeholders Group

The following summary comes from the Animas River Stakeholders Group via their webpage: "The Animas River Stakeholders Group is a collaborative effort of public and private interests whose mission is improving water quality and aquatic habitats in the Animas Watershed in southwestern Colorado. Participants include mining companies, elected officials, local citizens and interest groups, environmental organizations, and land owners including federal and state agencies. This innovative process and open forum meetings allow all parties to participate at a level suited to their interest and need. The group usually meets on the third Thursday of every month in Silverton, Colorado. Working group meetings, handling specific issues to put before the full group, normally meet preceding the monthly meeting."

The Upper Animas Watershed has a long history of extensive metal mining as an economic mainstay dating back to the 1880's Headwaters contamination, in the Silverton vicinity is from both mining activities and natural sources. In 1995 the Colorado Water Quality Control Commission adopted stricter standards for certain segments of the upper Animas with a delayed effective date at the Stakeholders request The commission then empowered the Animas River Stakeholders to locate and evaluate sources of metals contamination, determine potential improvement and prioritize sites for remediation in order to recommend achievable water quality standards and use classifications.

"The Stakeholders process involves the extensive collection and consolidation of the chemical, physical and biological component necessary to assess the impacts of contamination on aquatic life and habitat. Using this watershed approach, the Stakeholders will synthesize scientific findings with economic, social, and political consideration to influence future regulatory and land management decisions" (Animas River Stakeholders Group).

Source: Animas River Stakeholders Group Website

## Big Spring Creek Watershed Partnership

Big Spring Creek is located in Fergus County, Montana. The watershed is approximately 255,000 acres in size. The dominant land use in the watershed is agriculture, at 68%, the next is Forestry at 27%. Only 5% of this watershed is urban. A majority of the land is in private ownership, 85%, while the remaining land is federal, state, or county owned.

Big Spring Creek poses a unique characteristic by being the source of the nation's third largest spring. This watershed has many uses including recreation, wildlife habitat, irrigation, fisheries, flood retention, and drinking water supply. The focus of this watershed initiative includes the threatened uses, listed above, and the correlation to the local economy. The stressors threatening the above uses include nutrient loading, urban run off, siltation, turbidity, flooding and exotic species. The sources of these stressors include agricultural practices, logging, land use changes, development, septic systems, impervious surfaces, and loss of riparian areas.

Partners involved in the initiative include the following: urban residents, suburban residents, schools, rural residents, municipalities, absent landowners, conservationists, developers, and all levels of government.

The group formed in 1994, meeting quarterly and seeking to attain a measurable goal. To date they have achieved many goals within the watershed. They established an educational program on conservation easements. Thirty-nine landowners assisted in BMP installation. Riparian stream and watershed aquifer tours have been developed. The largest stream restoration project in Montana was initiated this year, 1999 Additionally, an environmental education center and trail development has occurred with partnership of schools. Finally, underway are efforts to manage community growth within the watershed.

Sources: National Watershed Network, Survey Results, Big Spring Creek Watershed Partnership Information Page, Big Spring Creek Watershed Handbook

## Huron River Watershed Council

The Huron River Watershed is a large watershed located in southeast Michigan spanning seven counties. The watershed is approximately 581,120 acres in size. The most recent available data on land use within the watershed is over twenty years old. According to the 1978 data the predominant land use was agriculture, with only 8.2% of the watershed classified as urban. One of the main issues in this watershed is that is has been rapidly urbanizing; therefore, it can be assumed that urban land use now far exceeds 8%. A majority of the land in the watershed is privately owned.

Thirty-eight miles of river and tributaries within this watershed have been designated as a "County Scenic River" under the Michigan Natural River's Act. The Huron River supports fishing, provides drinking water, and is relied upon for electricity and to meet agricultural and industrial demands The issues impacting this watershed are largely the result of land use changes, including rapid urbanization and suburbanization. These land use changes have led to problems with stormwater and agricultural runoff, mainly phosphorus loading, waste water treatment issues, fragmentation and loss of valuable wildlife habitat, fluctuation in flow, and loss of species biodiversity due to invasions by exotic species

The Lake Huron Watershed Council is the oldest watershed council in the state of Michigan. The group formed under Michigan's Local Rivers Management Act to serving as "a coalition of Huron Valley residents and local governments." The organization is currently involved in hands-on citizen education, river protection projects, and technical assistance in policy development. "With twenty-eight member governments and hundreds of individual members and volunteers, the Huron River Watershed Council inspires attitudes, behaviors, and

economies that protect, rehabilitate, and sustain the Huron River System" (Lake Huron Watershed Council)

Sources: Lake Huron Watershed Council Website, Email Survey Results

## Lake Champlain

The Lake Champlain Basin Program is an incredibly large watershed initiative The watershed is 1,960,000 acres in size covering two states, New York and Vermont, and lying in five counties. The size of this watershed alone supports the need for partnerships within watersheds that cross political boundaries. The northern end of the watershed is in Quebec, calling for support that crosses not only county and state boundaries, but also country boundaries. The greatest percentage of land use is agriculture at 83%, other at 11%, and urban at 6% The land classified as other is presumed to be government owned lands.

This watershed supports all water uses: drinking water, navigation, fishing, recreation, flood retention, hydroelectricity, irrigation, and wildlife habitat. The supported uses are vital to support the local economy As the supported uses are broad, so are the stressors to the watershed. This can be expected of a large scale watershed. The stressors include acid rain, runoff from agricultural practices, impact of dams, impact of logging practices, septic systems, loss of riparian area, shoreline and streambank erosion, and urban runoff These stressors result in numerous impacts including bacteria, increased Biological Oxygen Demand (BOD), decreed Dissolved Oxygen (DO), exotic species invasions, flooding, sedimentation, nutrient loading, increased heavy metals, turbidity, and loss of wildlife habitat.

Many stakeholders were brought together to work on the wide range of issues impacting this large watershed. The participants include conservationists, farmers, developers, all levels of government, rural residents, representatives of recreation, schools, suburban residents, and urban residents.

The group was established in 1990 and they meet "as needed " All of the stakeholders agreed upon the goal to implement "opportunities for action: an evolving plan for the future of Lake Champlain." To date, the group has agreed upon a common vision, prioritized the issues, set measurable goals, started monitoring, and developed an action plan. This action plan has resulted in many local projects including education and outreach, pollution prevention, watershed assistance within the watershed's smaller watersheds, local implementation, public access, grants for bikeways, technical assistance, and partnership plans for specific projects.

Sources: Lake Champlain Basin Program Brochure, National Watershed Network, Survey Results.

**Lake Whatcom Watershed Initiative**

The Lake Whatcom Watershed lies in Whatcom County Washington The watershed is approximately 33,000 acres in size. The largest percentage land use in the watershed is forestry at 75%.

The primary use supported by this watershed are drinking water supply, fisheries, navigation, recreational activities, and wildlife habitat Many different sources in the area are creating stresses upon the watershed. The concerns in this area come from land use changes, development, urban runoff, logging activities, streambank erosion, septic tanks, and other underground storage tanks. These activities cause impairment of supported water uses through bacteria, atmospheric deposition, flooding, increase of heavy metals, odors, pathogens, nutrient loading and decreased biological oxygen demand, introduction of toxic substances, turbidity, and a decreased in wildlife habitat.

The organization began in 1998 meeting weekly. They are comprised of landowners, conservationists, developers, foresters, all levels of government, schools, and tribes. The group has agreed upon a common vision of creating a "citizen initiative to buy up Lake Whatcom over

50-100 years to protect water supply." They see this as a measurable goal. More information on this organization is available on the Lake Whatcom Watershed Website.

Sources: National Watershed Network, Lake Whatcom Watershed Website, and Email Survey Results.

## Little Colorado Watershed Initiative

This watershed initiative is in its early stages of planning as an umbrella organization under the Little Colorado River Plateau Resource, Conservation, and Development Area, Inc. organization. This organization is a non-profit grassroots organization with support from local and tribal governments in the form of organization and leadership. The area of focus is upon the Four Corners region of Arizona and New Mexico. The mission of the organization is as follows: "to provide and coordinate leadership and partnerships to promote the conservation, development, and sustained use of our natural and human resources in east-central Arizona" (Little Colorado River Plateau RC&D).

"The Little Colorado River Watershed is the second largest watershed in Arizona, encompassing 27,000 square miles in Arizona and New Mexico. Land ownership is categorized as follows: 48% Indian Land, 23% Private Land, 14% National Forest Land, 10% State Trust Land, and 4% Bureau of Land Management Land. The combination of state and federal land within the watershed is 77%. The communities of Winslow and Holbrook, Arizona are the largest communities vulnerable to basin flooding events Levees in both towns have provided temporary flood protection. Sediment loading and Tamarisk invasion continue to aggrade the river reducing the levee's effectiveness over time" (Little Colorado River Plateau RC&D).

"On April 24 and 25, 199 community leaders, state and federal agencies joined together to convene the Little Colorado River Plateau Watershed Initiative Its purpose focused on solving environmental, social and economic problems on a watershed basis. A problem may affect one

community while the solution requires several communities and agencies to work together. The consensus of the conference participants was to use the Little Colorado RC&D as an umbrella organization to establish collaboration with various entities in the watershed. An Action Team was formed with Chuck Williams as Action Team leader. The Action Team will publish and distribute a conference report and press release" (Little Colorado River Plateau Resource, Conservation, and Development Area, Inc. Website)

This emerging group is currently in the process of hiring a watershed coordinator to work with the Little Colorado River Watershed Program Coordinating Team (PCT) in the organization and implementation of a watershed plan. However, this young organization has already employed many methods for public input including public meeting, newsletters, focus groups, email, presentations to organizations, multimedia advertisements, and a website. More information is available on the RC&D website at: http://doors.cybertrails.com/lcrcd/whatsnew.htm#watershed.

Sources. Little Colorado River Plateau Resource, Conservation, and Development, Inc. Website, Email Survey Results

## Ninnescah Watershed

The Cheney Lake Water Quality Project brings together the Kansas Rural Center and the Reno County Conservation District as partners in a watershed project that began in 1994. The primary objective is to provide farmers with financial support and technical advice to voluntarily implement farming practices that address water quality in the Ninnescah watershed and Cheney Lake, near Wichita, Kansas. This project, focusing upon the North Fork of the Ninnescah River and Cheney Lake, includes four counties and is approximately 633,000 acres in size. The predominant land use in this watershed is agricultural at 98%

The primary uses of water within this watershed are for drinking water supply, fisheries, recreational activities, and wildlife habitat. The focus of this project is upon the impacts of

agricultural activities within the watershed. These impacts include runoff from agricultural lands yielding siltation and increased nutrient loading, such as nitrogen and phosphorus. Another source of nutrient loading is failing, beyond capacity, or improperly installed septic systems. Animal manure odor from grazing practices is also included in the project's focus. Essentially, the initiative focuses upon water and soil quality, a very broad focus.

The partners involved in this initiative include absent landowners, rural residents, farmers, municipalities, and all levels of government.

The group formed in 1992, meeting monthly and having participant consensus upon the project's goal The initiative's agreed upon goal is, "to reduce watershed non-point source pollution to acceptable levels, particularly phosphorus and sediment." To date their measurable accomplishments include the implementation of numerous BMPs including critical area plantings, ponds, diversions, fencing, grassed waterways, range seeding, terracing. Additionally management systems have been implemented for household and animal waste, brush, nutrients, and pesticides.

An interesting discovery within the Ninnescah Watershed is that the nearby Wichita State University runs the Ninnescah Research Station with the objective of managing the tributaries to the Ninnescah River. A unique data collection tool applied by this group is Kite Aerial Photography (KAP) . Data gained in this manner can be used for input into GIS or for visual comparisons Additionally, this data collection tool may prove a cheaper alternative to that of aerial photography by airplane. Also, this tool may be useful to visually explain to stakeholders the impact individual and cumulative land uses may have on a watershed.

Sources: National Watershed Network, Survey Results, Ninnescah KAP Project.

## Norwalk River Watershed Association

The Norwalk River Watershed is within two states, New York and Connecticut, and spans seven townships. The watershed is 40,000 acres in size. The seven towns located within this watershed are Norwalk, Wilton, Ridgefield, Weston, and Redding in Connecticut and Lewisboro in New York. This indicates urban land use impacts within the watershed. According to the 1990 census, 65,587 people live in the watershed. U.S. Route 7, a major transportation corridor runs through the watershed.

The Norwalk River watershed is popular for it's recreational fishing spots. The mouth of the river is a tidal estuary and harbor, Long Island Sound, which is enjoyed by many for recreational activities and commercial fishing. The oyster industry serves as a cornerstone of the region's economy, dating back to pre-colonial times. Two-thirds of the watersheds resident depend upon public water supply systems while the others rely upon ground water from wells. The threats to the integrity of the watershed include stormwater runoff resulting from urban development and impervious surfaces, riverbank destruction and habitat loss resulting from land use changes, bacteria from failing septic systems and underground storage tanks, point source discharges from wastewater treatment plants and industrial discharge pipes, loss of native vegetation due to invasion by exotic species, and flooding as a result of land use changes.

The Norwalk River Watershed Partnership was initiated in 1996 involving the participation of individuals, community groups, businesses, and governmental agencies The association is a membership organization with the goal of "to improve both the water quality and the quality of life within the watershed by fostering research, education, cooperation, and action on the part of individuals, community groups, businesses, and governmental agencies in the seven watershed towns" (Norwalk River Watershed Association). Membership in the watershed organization starts at $25 and members are invited to free activities and receive the groups newsletter "In the Mainstream," outlining problems, projects, progress, and upcoming events.

Sources: National Watershed Network, Norwalk River Watershed Association

## Saginaw Bay Watershed

The Saginaw Bay Watershed is very large, involving over twenty counties in Michigan. The watershed itself is approximately 556, 800 acres in size. The land use in the watershed is predominately cropland at 46%, then forest land at 29%, state and county land at 15%, and lastly urban land use at 8%

"The Saginaw Bay Watershed is one of Michigan's most unique regions. This area covers the land and waterways that flow into the Saginaw Bay. The area consists of 1.4 million people, 8,700 square miles, 22 counties, and over 7,000 miles of rivers and streams. In this area, agriculture, heavy manufacturing, tourism, and outdoor recreation supply all the leading industries. But, the Saginaw Bay Watershed is not healthy. In fact, it has been declared an "Area of Concern" by the International Joint Commission on the basis of contaminated sediments, fish consumption advisories, degraded fisheries, loss of significant habitat and recreational values. Other problems of this area include land management practices, erosion, toxic contamination, and others" (Partnership for the Saginaw Bay Watershed).

The Partnership for the Saginaw Bay Watershed was established through the joining of the council for the Saginaw Bay and the Saginaw Bay Alliance. These people are on a "mission" to provide public and private cooperation for the concern of the wise use of the water in the Saginaw Bay. As you now know, this partnership provides education, advocacy, and monitoring activities for the residents of the Saginaw Bay Watershed, so the people that are living there are informed of the condition of the Saginaw Bay. Different citizens, environmental educators, business representatives, agricultural producers, local governments and others are now working together to restore the quality of the Saginaw Basin

The Partnership for the Saginaw Bay Watershed established one of the largest high school river monitoring programs in the country. They also started the now well known Adopt-A-Stream Program. They have performed hundreds of presentations to local governments, businesses, civic groups, and schools. They established several sub- watershed based advocacy organizations. They also provide the answers to thousands of concerned citizens' questions. They established ordinances that would protect the region's water quality. They developed the Saginaw Bay Watershed's first storm drain stenciling project. And they hold teacher's training workshops for the schools that are involved in water quality sampling. These are just some of the things that the partnership does to better the quality of the water in the Saginaw Bay.

Sources: National Watershed Network, Partnership for the Saginaw Bay Website

## Wappinger Creek Watershed Initiative

The Wappinger Creek Watershed lies in Dutchess County, New York. The watershed in approximately 134,400 acres in size. The largest percentage land use in forestry at 45%, then agriculture (cropland, grazing, and pasture) at 35%, then urban at 15%, and lastly mining at 5% 75% of the land is privately owned, while the rest in government owned, 5% by the federal government, and 20% by the state and/or county government.

The main use supported by the watershed include recreational activities, fisheries, hydroelectricity, irrigation and wildlife habitat; all of these activities support the local economy. The group is focusing on water quality, water quantity, soil quality, wildlife habitat, and fisheries including the impacts on the local economy. The sources of pollutants that affect these focuses include animal manure, dams, agricultural practices, dredging, irrigation, septic tanks, land use change, loss of riparian areas, urban development, and urban runoff. The resulting pollutants of these stressors are bacteria, exotic species invasions, nutrient loading and decreased biological

oxygen demand, flooding, sedimentation, temperature changes, turbidity, and loss of wildlife habitat.

The group formed in 1995, meeting monthly. The organization is composed of landowners, developers, environmental groups, all levels of government, representative of recreation, and schools. All of the stake holders agreed upon a measurable goal. The goal is "to protect and enhance water quality; to manage growth and development in the watershed; to protect critical environmental resources such as wetlands, fish, and wildlife habitat, unique geological features (waterfalls, scenic vistas, stream corridors, etc.), to promote recreation and tourism; and to promote business and industry in the watershed. To identify and prioritize problematic areas and cumulative impacts within the Wappinger watershed and involve parties and municipalities in developing and implementing remediation, best management practices (BMP's) and prevention measures, so that water quality and biotic integrity can be maintained and improved on a sustainable basis" (Wappinger Creek Watershed Association)

To date the group has made measurable progress towards their goals. They watershed and sub-watershed area has been delineated with a complete geographic information system (GIS) land use study. They completed an economic impact study of the county economy in relation to the watershed. There is an on going volunteer monitoring program in place. More involvement was encouraged through presentations to local town boards and to planning boards. A watershed conference was planned for November of 1998 to aid in further collection of information to use in development of a comprehensive watershed management plan.

Sources: National Watershed Network, Wappinger Creek Watershed Association

# APPENDIX B

# SURVEY PHASE I & RESULTS

# Survey #1 ~ Means for Public Input

The University of Tennessee Water Resources Research Center has identified you as being involved in a local watershed initiative We are currently conducting a study of public participation in watershed initiatives across the country We would like to ask you just a few brief questions regarding public involvement in your watershed initiative

These questions are

1) Who are the primary participants in your watershed initiative?
___Individuals
___Agencies (Specify_____)
___Business/Industry
___Organizations
___Other_____

2) Have you involved the public and/or interest groups in your watershed initiative?
yes___ no___

-If no, why not?

-Do you think the lack of public involvement has affected, or is affecting, your watershed initiative?

3) What method(s) or process(es) has been used to solicit public input for the watershed initiative?
___Public Meetings
___Newsletters or other publications
___Interactive workshops and/or Focus groups
___Email
___Virtual Chat Sessions
___Presentations to schools and/or other organizations
___Television/radio advertisements
___Websites
___Other_____

4) Have you found these method(s) or process(es) to be effective (i e., have they helped you achieve your project goals)?
yes___ no___

Please explain

5)Can we contact you for additional information on your watershed initiative, if needed?
yes___ no___

We thank you for being involved in our study Your response will be kept confidential and is invaluable to our study We would be happy to provide you with a copy of the results of our study If you would like a copy, please let us know, by providing your mailing address

Thank you for your time!

- know your watershed
- EPA office of water, publications
- Search using search engines, dogpile

## Summary of Survey (Phase I) Results
## Public Participation Mechanisms and Effectiveness

27 Total Survey sent out with follow-up surveys
2 Returned for wrong address
1 Not at local level
Out of remaining 24 surveys, 10 groups responded
Response rate = 42%

Following is a summary of the responses from the 10 watershed initiative groups to respond

1) Who are the primary participants in your watershed initiative?

- 9/10 Individuals
- 9/10 Agencies
- 7/10 Business/Industry
- 7/10 Organizations
- 3/10 Other

2) Have you involved the public and/or interest groups in your watershed initiative?

- 10/10 Yes
- 0/10 No
- 1/10 Public Involvement recently began

-Affect

- 1/10 Answered this question in regards to the positive affect of public input (4)
  -State and Federal Agencies signed pledge recognizing watershed initiative committee's Watershed Action Plan (October 21, 1998)

-Do you think the lack of public involvement has affected, or is affecting, your watershed initiative?

- 3/10 Answered this question (2,6,9)
- 1/10 Only recently started to involve public, didn't elaborate (6)
- 2/10 Public involvement adequate, however more needed, trying to solicit

3) What method(s) or process(es) has been used to solicit public input for the watershed initiative?

- 9/10 Public Meetings
- 10/10 Newsletters or other publications
- 8/10 Interactive workshops and/or Focus groups
- 6/10 Email
- 0/10 Virtual Chat Sessions
- 10/10 Presentations to schools and/or other organizations

5/10 Television/radio advertisements
8/10 Websites
1/10 Other Organization's Newsletters
1/10 Symposiums
2/10 Newspaper Articles
1/10 Watershed Booklet
2/10 Brochures
1/10 Public Service Announcements
1/10 Personal Phone Calls
1/10 Personal Peer Recruitment
1/10 Signs in the Watershed
1/10 Festival
1/10 Workshops
1/10 Roundtable

4) Have you found these method(s) or process(es) to be effective (i e , have they helped you achieve your project goals)?

10/10 Yes
0/10 No

-Listed below are individual group comments relating to the effectiveness of the methods used to solicit public involvement.

- Projects works increased and accelerated due to increased participation and acceptance (1)
- Small meetings, within individuals' homes and on neutral grounds most effective (2)
- Use of computer generated lists to identify individuals who've not participated, or attended meetings (2)
- Provide meals or snacks as incentives to attend meetings
- Good turnout at workshops (2)
- Need for more public input and awareness from the adult audiences (3) (Have already targeted school-age audience)
- Plan for Public Service announcements and partnership with a local TV station to involve more audiences. (3)
- Effective in diverse input resulting from diverse information sources. (4)
- Website is very effective in informing and generating public interest. (6)
- People request involvement information via Email, response to website (6)
- Methods used effective on a small budget, without media assistance (7)
- Newsletters and newspaper effective in publicizing very successful watershed conference, with approx. 100 watershed parties involved (9)

| | Group #1- Big Spring Creek Watershed |
|---|---|
| **.estion #1 - Participants** | |
| Individuals | X |
| Agencies | X |
| Business/Industry | X |
| Organizations | X |
| Other | X |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X |
| Interactive Workshops - Focus Groups | X |
| Email | |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | |
| Websites | |
| Other | Watershed Booklet - Listing all resource contacts |
| Tours | X |
| wspaper Articles | X |
| Encourage city council mtg attendance | X |
| Encourage letters to local officials | X |
| Encourage letters to newspaper editors | X |
| "Good Neighbor Watch" of Stream Resources | X |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | Increased project works |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | X |
| Watershed Size | Large - 440 stream miles - 150 sq miles |
| Location | Montana |
| Land Use Classification | Mainly agricultural, includes city of Lewiston |
| Initiative Initiation | Initially, flood control project 1960's |
| Reactionary | X |
| Proactionary | |
| | |
| | |

City of Wichita

| | Group #2 - Ninnescah Watershed |
|---|---|
| **estion #1 - Participants** | |
| Individuals | X |
| Agencies | X - NRCS, BOR, USGS, KS Dept Health, EPA |
| Business/Industry | |
| Organizations | X - Conservation Districts, Kansas Rural Center |
| Other | X - City of Wichita |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | Farmer involvement |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X |
| Interactive Workshops - Focus Groups | X |
| Email | |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | |
| Websites | |
| Other | X |
| Tours | |
| wspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | X |
| Personal recruitment of demo projects | X |
| Signs in H2Oshed (demo site & further contact) | X |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | Small meetings work best, meals provided |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | No |
| Watershed Size | |
| Location | |
| Land Use Classification | Agricultural |
| tiative Initiation | |
| eactionary | |

| | Group #3 - Lake Champlain Basin Program |
|---|---|
| **estion #1 - Participants** | |
| Individuals | X |
| Agencies | X- States of NY& VT EPA USFWS, USGS, NOAA, NPS, Quebec Ministry of Environment |
| Business/Industry | X |
| Organizations | X |
| Other | Citizen Advisory Meetings involve all groups |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X - Watershed Newsletter "Casin the Basin" |
| Interactive Workshops - Focus Groups | |
| Email | |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | X (Public Service Announcements) |
| Websites | X |
| Other | |
| urs | |
| Newspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Personal recruitment of demo projects | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X - Will use PSA & News station to broadcast mtgs |
| No | |
| Explain? | Public input & awareness valuable |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | Yes, also website http://www kbp org |
| Watershed Size | Large - 8,234 sq miles |
| Location | Vermont, New York, Quebec |
| nd Use Classification | |
| tiative Initiation | 1990 Lake Champlain Special Designation Act |

Pub. involvement from beginning, but participants all from agencies?

| | Group #4 - Norwalk River Watershed Initiative |
|---|---|
| **Question #1 - Participants** | |
| Individuals | |
| Agencies | Reps from federal and state agencies & local municipalities |
| Business/Industry | |
| Organizations | |
| Other | |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | Watershed Initiative Plan |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X - (including other organization newsletters) |
| Interactive Workshops - Focus Groups | X |
| Email | |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X -presentations at meetings conferences, workshops |
| Television - Radio Advertisements | X - Radio |
| Websites | X |
| Other | |
| Tours | |
| wspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Personal recruitment of demo projects | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | Reach variety of people via variety of sources |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | No, see website |
| Watershed Size | |
| Location | |

| | Group #5 - Huron River Watershed Council |
|---|---|
| **...estion #1 - Participants** | |
| Individuals | X |
| Agencies | X - MI Dept of Environ Quality, EPA |
| Business/Industry | X |
| Organizations | |
| Other | X - Local elected officials, government, planning commissions, |
| | utility departments, drain commissions |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X |
| Interactive Workshops - Focus Groups | X |
| Email | X |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | X |
| Websites | |
| Other | X - print ad, workshops, roundtable, creek groups, festivals |
| urs | |
| Newspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Personal recruitment of demo projects | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | [redacted] |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | |
| Watershed Size | |
| Location | |
| nd Use Classification | |
| ...itative Initiation | |

| | Group #6 - Saginaw Bay Watershed Initiative |
|---|---|
| **Question #1 - Participants** | |
| Individuals | X |
| Agencies | X - Federal, State, Local |
| Business/Industry | X |
| Organizations | X |
| Other | |
| | |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | Focus only recently enlarged to involve public |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | |
| Newsletters & Other Publications | |
| Interactive Workshops - Focus Groups | |
| Email | X |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | |
| Websites | X |
| Other | |
| | |
| Newspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Personal recruitment of demo projects | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | Websites generate interest |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | |
| Watershed Size | |
| Location | |
| Land Use Classification | |
| Initiative Initiation | |

| | Group #7 - Lake Whatcom Watershed Initiative |
|---|---|
| **Question #1 - Participants** | |
| Individuals | X |
| Agencies | |
| Business/Industry | |
| Organizations | |
| Other | |
| | |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X |
| Interactive Workshops - Focus Groups | X |
| Email | X |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | |
| Websites | X |
| Other | |
| urs | |
| Newspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Personal recruitment of demo projects | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | Yes, gets the word out on a small budget, no help from press |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X, Website http://www.nas.com/tig/ |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | |
| Watershed Size | |
| Location | |
| nd Use Classification | |
| itiative Initiation | |

Need Info.

| | Group #8 - Little Colorado Watershed Initiative |
|---|---|
| **Question #1 - Participants** | |
| Individuals | X |
| Agencies | X - State and Federal |
| Business/Industry | X |
| Organizations | X |
| Other | |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X |
| Interactive Workshops - Focus Groups | X |
| Email | X |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | X |
| Websites | X |
| Other | |
| Tours | |
| wspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | |
| Watershed Size | |
| Location | |
| Land Use Classification | |
| Initiative Initiation | |
| actionary | |
| oactionary | |

| | Group #9 - Dutchess County (Wappinger Creek Watershed) Initiative |
|---|---|
| **Question #1 - Participants** | |
| Individuals | X |
| Agencies | X - (Too numerous, see survey) |
| Business/Industry | X |
| Organizations | X |
| Other | |
| | |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | Involvement adequate, but always soliciting more |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X |
| Interactive Workshops - Focus Groups | X |
| Email | X |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | |
| Websites | X |
| Other | |
| ours | |
| Newspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Personal recruitment of demo projects | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | Hosted watershed conference, Newspapers & Newsletters effective |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | |
| Watershed Size | |
| Location | |
| eactionary | |
| roactionary | |

100

| | |
|---|---|
| **Question #1 - Participants** | |
| Individuals | X |
| Agencies | X |
| Business/Industry | X |
| Organizations | X |
| Other | Most involvement from agencies |
| | |
| **Question #2 - Public Involvement** | |
| Yes | X |
| No | |
| Affect? | |
| | |
| **Question #3 - Input Solicitation** | |
| Public Meetings | X |
| Newsletters & Other Publications | X |
| Interactive Workshops - Focus Groups | X |
| Email | X |
| Virtual Chat Sessions | |
| Presentations to Schools and other organizations | X |
| Television - Radio Advertisements | X |
| Websites | X |
| Other | X -Symposiums, newspaper articles, publications |
| Tours | |
| ewspaper Articles | |
| Encourage city council mtg attendance | |
| Encourage letters to local officials | |
| Encourage letters to newspaper editors | |
| "Good Neighbor Watch" of Stream Resources | |
| Personal phone calls from peers (other farmers) | |
| Signs in H2Oshed (demo site & further contact) | |
| | |
| **Question #4 - Effectiveness** | |
| Yes | X |
| No | |
| Explain? | |
| | |
| **Question #5 - Additional Contact?** | |
| Yes | X, website http//www waterinfo org arsg |
| No | |
| | |
| **Misc** | |
| Additional Information Included? | |
| Watershed Size | |
| Location | |
| Land Use Classification | |
| Initiative Initiation | |
| eactionary | |
| roactionary | |

# APPENDIX C

# SURVEY PHASE II & RESULTS

# SURVEY PHASE II RESULTS

**Group 1:**

Let me summarize, before you wade through the "fragmented" responses, because your questions don't seem to lend themselves smoothly to a meaningful description of our activity: Public education and public input has been the essential activity of our ad-hoc citizen group to date-- that's about all we've done, although we may have had some influence on elected officials because of the spotlight we keep on the specified problem.

We started with a known problem: Our potable-water supply watershed basins are being urbanized -- at risk to the safety of the water supply. There is no other viable water source -- just that one large lake. The short-and-long-term goals set by the jurisdictions 8-years ago put land acquisition as Goal #2 of 21, yet all the local governments continue to approve building and urbanization within the water reservoir basin Previous groups have tried to get a moratorium on building, even a temporary one -- and failed. We asked Council Members and the Mayor for a major push on Goal #2, and met with an entrenched snub.

We are therefore taking the protection of the water supply directly to the people as an Initiative to the Voters. Our group action to date has been to: 1) continue to try to get the jurisdictions to act on their own volition (zilch); and 2) write legislation to implement Goal #2 - buy the watershed lands and hold them in forest. Crafting the terms of the Ordinance has been our principal activity -- and has been done with extensive input from many sources and people -- your "public input". With extensive input from many sources and people -- your "public input". We met individually, in groups, spoke at meetings, swapped emails, did press releases, and telephoned people for input to the Ordinance.

Exactly this week (Feb 1999) the Initiative was filed with the City -- and our activity now switches to gathering signatures to place it on the ballot (about three months' time), and later will be educating the voters to achieve a YES vote on the program in November.

I hope this will help to interpret the answers, which I had some difficulty in making a fit to our groups' activity.

---

>1)__NO__ To prioritize watershed problems
> -Please identify how public input has been used throughout this process

Not well applicable: We started with a known problem. -How useful has this input been to this prioritization effort?
> (Very useful, Somewhat useful, Minimally useful)
>
>2)__NO__ To establish a K-12 educational program
> - Please identify how public input was used to establish and implement
>this program

Not applicable. No action in this arena. Likely in the future.

> - How useful has this input been to carrying out this educational effort?

> (Very useful, Somewhat useful, Minimally useful)
>
>3)__YES__ To establish a public awareness and/or education campaign
> - Please identify how public input has been used to establish and
>implement these campaigns

We held individual meetings with activists, scientists, elected officials and staff, the average public, and businesspeople, to both explain our proposal for the solution to the identified problem (buy the watershed lands) and gather ideas for implementation details. We also spoke atlands) and gather ideas for implementation details We also spoke at organizational meetings, spoke during Q&A periods of hearings, committee meetings and City/County Council (commissioners in some places) meetings.

We created a website for the proposal, advertised it, and collected responses from viewers.

We are just now beginning to hold our own public meetings to drum up interest and support for the proposal, now that the language has been fixed.

> - How useful has this input been to carrying out these campaigns?
> (Very useful, Somewhat useful, Minimally useful)

Very useful, (in fact, the core of our activity to date).

>
>4)__YES__ To influence the enactment of new laws, regulations, and/or policies
> - Please identify how public input has been used in this process.

(Ditto answer # 3)· We held individual meetings with activists, (Ditto answer # 3). We held individual meetings with activists, scientists, elected officials and staff, the average public, and business people, to both explain our proposal for the solution to the identified problem (buy the watershed lands) and gather ideas for implementation details We also spoke at organizational meetings, spoke during Q&A periods of hearings, committee meetings and City/County Council (commissioners in some places) meetings.

We created a website for the proposal, advertised it, and collected responses from viewers.

> - How useful has this input been to carrying out this process?
> (Very useful, Somewhat useful, Minimally useful)

It is too early to have achieved enactment -- that is the essential _goal_ of the Group

>
>5)_SORT-OF___ To better enforce existing laws, regulations, and/or policies

> - Please identify how public input has been used in this process Our proposal calls for actually _doing_ one of the several goals
established long ago (i.e.: following stated policy), but ignored by the
local governments (City and County), who have concentrated their efforts on
others of the goals list.

> - How useful has this input been to carrying out this process?
> (Very useful, Somewhat useful, Minimally useful)

Again, our work to date has been: crafting proposed legislation; public
input has been a fundamental method of refining the exact terms of the new
program.

>
>6)_NO___ To establish local watershed-improvement efforts (e.g., community
>creek cleanup, volunteer monitoring)
> - Please identify how public input has been used in the planning and
>implementation of these efforts.
> - How useful has this input been to carrying out the efforts?
> (Very useful, Somewhat useful, Minimally useful)

There are one or more other organizations doing such field work. 7)____ Other (Please Specify)
> - Please identify how public input has been used in this/these other
>effort(s).
> - How useful has this input been to carrying out this/these effort(s)?
> (Very useful, Somewhat useful, Minimally useful)

**Group 2:**

1)__X__ To prioritize watershed problems
-Please identify how public input has been used throughout this process.
-How useful has this input been to this prioritization effort?
(Very useful, Somewhat useful, Minimally useful)

*In order to develop a watershed management plan that will be implemented we need the public and local municipalities to play a pivotal role in the development of the management plan. The input from the local municipalities and the public has been very useful in identifying watershed problems, and ensuring the watershed management plan is comprehensive. The Wappinger Creek Watershed Planning Committee is a volunteer committee comprised of municipality representatives, local citizens, and agency personnel This committee is an example of local citizens providing stewardship for the largest watershed in Dutchess County, NY.*

2)____ To establish a K-12 educational program
- Please identify how public input was used to establish and implement
this program.
- How useful has this input been to carrying out this educational effort?
(Very useful, Somewhat useful, Minimally useful)

3)__X__ To establish a public awareness and/or education campaign
- Please identify how public input has been used to establish and
Implement these campaigns.
- How useful has this input been to carrying out these campaigns?

(Very useful, Somewhat useful, Minimally useful)
*We focus our educational programs on the issues the public requests information about (supply & demand) In the case of the Wappinger Creek Watershed Planning Committee we've developed an education/public outreach subcommittee that is comprised of local citizens The public has been very useful with our program, but we can always get more people involved For any management plan to be successful public awareness is extremely important.*

4)__X__ To influence the enactment of new laws, regulations, and/or policies
- Please identify how public input has been used in this process.
- How useful has this input been to carrying out this process?
(Very useful, Somewhat useful, Minimally useful)

*We haven't attempted to get new laws or regulations enacted yet, this could be a part of the watershed management plan This is a very sticky subject in Dutchess County and could alienate some municipalities and citizens We've had more success with voluntary best management practice policies, but the public doesn't play a large role in these programs. However, they are minimally useful because it is the public implementing the best management practices.*

5)__X__ To better enforce existing laws, regulations, and/or policies
- Please identify how public input has been used in this process.
- How useful has this input been to carrying out this process?
(Very useful, Somewhat useful, Minimally useful)

*The public has been very useful in detecting violations and reporting them to the proper authorities. The New York State Department of Environmental Conservation is understaffed so I feel local citizens need to step up and monitor their local watersheds We've had several instances when local citizens have identified problems that required remediation*

6)__X__ To establish local watershed-improvement efforts (e.g., community creek cleanup, volunteer monitoring)
- Please identify how public input has been used in the planning and implementation of these efforts.
- How useful has this input been to carrying out the efforts?
(Very useful, Somewhat useful, Minimally useful)

*We have three creek clean-ups that are implemented using the public The WCWPC also has volunteer stream teams that conduct physical surveys on local waterways The planning committee also has a volunteer biological monitoring program that collects benthic macroinvertebrate samples twice a year from twelve sites in the Wappinger Creek watershed The volunteers identify the macroinvertebrates throughout the year. The public is very useful in all the above programs, without public involvement the programs wouldn't work.*

7)____ Other: (Please Specify)
- Please identify how public input has been used in this/these other effort(s).
- How useful has this input been to carrying out this/these effort(s)?
(Very useful, Somewhat useful, Minimally useful)

**Group 3:**

>1)__x__ To prioritize watershed problems
> -Please identify how public input has been used throughout this process.
Public input at farmer meetings has been useful in guiding us to the cost share programs that are most helpful to farmers in addressing water quality

contamination. Some farmer input is requested in designing cost share programs - methods of payment, incentive payments, etc. -How useful has this input been to this prioritization effort?
> (Very useful, Somewhat useful, Minimally useful)--Very Useful
>
>2)____ To establish a K-12 educational program
> - Please identify how public input was used to establish and implement
>this program.
> - How useful has this input been to carrying out this educational effort?
> (Very useful, Somewhat useful, Minimally useful)
>
>3)____ To establish a public awareness and/or education campaign
> - Please identify how public input has been used to establish and
>implement these campaigns.
> - How useful has this input been to carrying out these campaigns?
> (Very useful, Somewhat useful, Minimally useful)
>
>4)____ To influence the enactment of new laws, regulations, and/or policies
> - Please identify how public input has been used in this process.
> - How useful has this input been to carrying out this process?
> (Very useful, Somewhat useful, Minimally useful)
>
>5)____ To better enforce existing laws, regulations, and/or policies- Please identify how public input has been used in this process
> - How useful has this input been to carrying out this process?
> (Very useful, Somewhat useful, Minimally useful)
>
>6)____ To establish local watershed-improvement efforts (e.g., community
>creek cleanup, volunteer monitoring)
> - Please identify how public input has been used in the planning and
>implementation of these efforts.
> - How useful has this input been to carrying out the efforts?
> (Very useful, Somewhat useful, Minimally useful)
>
>7)____ Other· (Please Specify)
> - Please identify how public input has been used in this/these other
>effort(s).
> - How useful has this input been to carrying out this/these effort(s)?
> (Very useful, Somewhat useful, Minimally useful)

**Group 4:**

> 1)___x_ To prioritize watershed problems
> -Please identify how public input has been used throughout this process.
> -How useful has this input been to this prioritization effort?
> (xVery useful, Somewhat useful, Minimally useful)
>
> 2)____ To establish a K-12 educational program
> - Please identify how public input was used to establish and implement
> this program.
> - How useful has this input been to carrying out this educational

effort?
> (Very useful, Somewhat useful, Minimally useful)
>
> 3)___x_ To establish a public awareness and/or education campaign
> - Please identify how public input has been used to establish and
> implement these campaigns.
> - How useful has this input been to carrying out these campaigns?
> (Very useful, xSomewhat useful, Minimally useful)
>
> 4)___x_ To influence the enactment of new laws, regulations, and/or
policies - Please identify how public input has been used in this process.
> - How useful has this input been to carrying out this process?
> (xVery useful, Somewhat useful, Minimally useful)
>
> 5)___x_ To better enforce existing laws, regulations, and/or policies
> - Please identify how public input has been used in this process.
> - How useful has this input been to carrying out this process?
> (xVery useful, Somewhat useful, Minimally useful)
>
> 6)___x_ To establish local watershed-improvement efforts (e.g , community
> creek cleanup, volunteer monitoring)
> - Please identify how public input has been used in the planning and
> implementation of these efforts.
> - How useful has this input been to carrying out the efforts?
> (xVery useful, Somewhat useful, Minimally useful)
>
> 7)____ Other: (Please Specify)
> - Please identify how public input has been used in this/these other
> effort(s).
> - How useful has this input been to carrying out this/these effort(s)?
> (Very useful, Somewhat useful, Minimally useful) M. Wilks

## Group 5:

> 1) YES To prioritize watershed problems
> -Please identify how public input has been used throughout this process.
> -How useful has this input been to this prioritization effort?
> (Very useful, Somewhat useful, Minimally useful)

During the entire formulation of the plan for Lake Champlain, public input was used. A list of priority actions for the Lake Champlain Basin was created with input from the public and other sources, such as scientists, state and federal agencies, etc. Now that the plan has been in effect for two years, public input is still solicited to make sure that the priority actions are still important and to determine if there are new or evolving issues that were not addressed in the original plan. Currently. this process is somewhat useful; however, it has been harder to keep the public still involved in the process since the plan was approved. Attendance at public meetings is not as great now as when the plan was being formulated. During the plan formulation, I would characterize the publicbeing formulated During the plan formulation, I would characterize the public input as very useful.

>
> 2)__YES__ To establish a K-12 educational program
> - Please identify how public input was used to establish and implement
> this program.
> - How useful has this input been to carrying out this educational effort?
> (Very useful, Somewhat useful, Minimally useful)
>
Education and outreach programs were identified as a priority under the process described in question 1. Public input has helped the program to continue to be funded for participating in an cooperative educators initiative (provides teacher training workshops), providing school presentations, producing a resource book for educators to teach about Lake Champlain and its basin, and funding a resource room at the Lake Champlain science center Public input has been very useful in this process. Recently, our Citizen Advisory Committees have been very supportive of education and outreach.

> 3)__YES__ To establish a public awareness and/or education campaign
> - Please identify how public input has been used to establish and implement these campaigns.
> - How useful has this input been to carrying out these campaigns?
> (Very useful, Somewhat useful, Minimally useful)

We've heard from the Citizen Advisory Committees that they feel the general public (esp. adult audiences) are not aware of Lake Champlain Basin issues or of the Lake Champlain plan and its projects. The CACs input has been very useful in gaining support for funding public awareness campaigns, such as public service annoucements
>
> 4)__YES__ To influence the enactment of new laws, regulations, and/or policies
> - Please identify how public input has been used in this process.
> - How useful has this input been to carrying out this process?
> (Very useful, Somewhat useful, Minimally useful)
>
Although, this program is not a regulatory program, public input through this program has been somewhat useful to guide the states' efforts in implementing new laws and policies. For example, there has recently been a public push to develop a joint NY/VT fishing license for Lake Champlain The LCBP has been given funding to conduct a feasibility study of such a policy.

> 5)__YES__ To better enforce existing laws, regulations, and/or policies
> - Please identify how public input has been used in this process.
> - How useful has this input been to carrying out this process?
> (Very useful, Somewhat useful, Minimally useful)
Again, the LCBP is not a regulatory agency itself; however, the LCBP does receive public input on enforcing existing state and/or federal laws through its Citizen Advisory Committees. For example, the State of Vermont is making some changes to the enforcement of the best management practices for farms, which were in part influenced by the Vermont CACs recommendations. In this case, the process was very useful.
>

> 6)__YES__ To establish local watershed-improvement efforts (e.g., community
> creek cleanup, volunteer monitoring)
> - Please identify how public input has been used in the planning and
> implementation of these efforts.
> - How useful has this input been to carrying out the efforts?
> (Very useful, Somewhat useful, Minimally useful)
>

Public input through the CACs has continued to help the LCBP provide funding to
Public input through the CACs has continued to help the LCBP provide funding to
many local watershed improvement efforts throughout the basin. The input from the CACs helps the LCBP to balance its funding between local implementation projects by communities and/or not-for-profits and funding to the state agencies. The LCBP's local grants program has been very useful in both improving the watershed and helping to foster public support for the Lake Champlain plan.

> 7)____ Other: (Please Specify)
> - Please identify how public input has been used in this/these other
> effort(s).
> - How useful has this input been to carrying out this/these effort(s)?
> (Very useful, Somewhat useful, Minimally useful)

**Group 6:**

Ques. 1: To prioritize watershed problems the public participated in a group discussion regarding environmental issues and interests. All responses were written down on flip charts and recorded in the minutes. Because the list was extremely long - a consensus was taken to group issues/interests into categories· habitat restoration, land use, stewardship, water quality and flood protection. From there a decision was made to form sub-committees - wiyh each person choosing a group they had the most interest in. Some signed up for more than one - Habitat Restoration, Water Quality, Stewardship and Education, and Land Use/Flood Control/Open Space. (VERY USEFUL)

Ques. 2: To establish a K-12 educational program - there were environmental organizations on the full committee who specialized in educational outreach to students - and who incorporated the watershed project in their programs The general public was not involved in developing the programs - however, they did volunteer their services by working along with the organizations and the students. (VERY USEFUL)

Ques. 3: To establish a public awareness and/or education campaign - the Stewardship and Education Sub-committee held public informational meetings and mailed out a public survey. They also attended other public functions to keep the public informed of what was happening in their watershed. (VERY USEFUL)

Ques. 4: To influence the enactment of new laws, regulations, and/or policies - the Committee gathered the rules and regulations from each of the 7 towns involved in this watershed initiative. The data was reviewed and recommendations were made.(VERY USEFUL)

Ques: 5: To better enforce existing laws, regulations, and/or policies - each of the 7 towns had municipal officials on the full and sub
Ques: 5: To better enforce existing laws, regulations, and/or policies - each of the 7 towns had municipal officials on the full and sub committees. In order to reach the goals of the initiative, each town signed a pledge endorsing the final action plan. (VERY USEFUL)

Ques. 6. To establish local watershed-improvement efforts - the Committee decided by consensus what issues they would work on, and set goals to achieve them. To date: streamwalks, streambank restorations and aquatic habitat restoration have been completed. The action plan includes the goals of the watershed initiative. (VERY USEFUL)

Ques 7: Other: When the public is involved in the process from the very beginning, a sense of "ownership" develops. They begin to feel like they have some control in what happens in their communitity, in their backyards - they're making the decisions (or are a part of the decision making process). The public responds better to "what do you think?" "how do you see this happening?" instead of "this is how it's going to be done, like it or not!" When they participate they "buy-in" to the process and make it their own. This type of approach is - VERY USEFUL!

**Group 7:**
Did not respond

**Group 8:**
Did not respond

**Group 9:**
Did not respond

**Group 10:**
1) To prioritize watershed problems. – We used a nominal group process in initial meetings of watershed partnership to identify and prioritize problems. The committee updates and refines periodically. Very Useful
2) We work cooperatively with the local school district, targeting the junior high (grades 6-8) and are in the process of developing an Environmental Education Site on Big Spring Creek Teachers are active committee members. Very Useful.
3) Through a Community Visioning process that was going on at the same time the Watershed Partnership was being established. Community meetings of various committees were held that identified community needs. Very useful.
4) No answer.
5) Watershed Partnership committee members organized and hosted meetings with EPA, DEQ, DNRC, FW&P, and Governor to create interest, support and arrange for financing to conduct assessments and proposed remediation efforts on an abandoned Railroad industrial site along Big Spring Creek Very Useful.
6) Through public meetings held in December 1997, the committee created interest and support for an ongoing (Fall, 1999) one of the largest stream restoration projects to be done in the

state of Montana where a previously channelized stream reach is in the process of renaturalization with meanders and fish habitat features. Very Useful.

# VITA

Laura Marie Wilks-Duncan, a native of Knoxville, Tennessee, graduated from Bearden High School in 1992. After graduation she was a presidential scholar at the University of Alabama where she received her Bachelor of Science Degree with majors in both biology and marine science in 1995. At the University of Alabama she enjoyed summers studying at the Dauphin Island Marine Lab on Dauphin Island, Alabama. Laura's love for natural resources took her to Aravada, Colorado after graduation where she worked as an Environmental Careers Organization Associate (ECO) for the U.S. Geological Survey's (USGS) National Water Quality Assessment (NAWQA) program's Biological Unit.

While living in the Denver area and working on national water quality issues she became interested in land use impacts on water quality and soon discovered the field of urban and regional planning. In the Fall of 1997, Laura left the magnificent Rocky Mountains and returned home to the beautiful Smoky Mountains to pursue a degree in urban and regional planning, with a concentration in environmental and land use planning and a minor in environmental policy, at the University of Tennessee, Knoxville. Laura was offered a graduate assistantship from the School of Planning and the UT Water Resources Research Center (WRRC) to help fund her educational endeavors. The support and experience was invaluable, lending great inspiration to Laura's thesis. She received her Master of Science in Planning Degree from the University of Tennessee in May, 2000. Laura is presently employed as a senior research assistant at the UT WRRC, working as the watershed coordinator for the Tennessee Clean Water Network, a state-wide non-profit organization working to develop, support, and improve community efforts to assure the integrity of watersheds across Tennessee.