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A Tool for Assessing and Improving the Capacity of
Local Watershed Partnerships to Produce Lasting
Effects

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

Jennifer Parris Joice
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ABSTRACT

Water resource issues continue to be a central focus of natural resource policy, due to the increasing pressures on water resources and the complex nature of water systems. There has been significant advancement in the recognition that water system health is dependent upon human activities and social understanding of the resource. This awareness has prompted the arrival of institutions that are concerned with helping society understand and support water resource improvement. Often referred to as watershed partnerships, these institutions typically function as collaborative bodies that highlight cooperation and water resource education. As resource pressures increase, so do the demands on these partnerships to produce tangible watershed improvement results. Assessments of watershed partnerships have therefore been developed to evaluate their work and results. The mainstream watershed partnership assessments have been criticized for their inability to capture partnership characteristics that lead to lasting watershed recovery and typically provide little insight for how these partnerships can improve. The need for partnership assessments that speak to these criticisms is becoming ever more imperative as we continue to confront modern water resource issues.

This research focuses on the creation of an assessment tool that addresses these criticisms of conventional watershed assessments. The goals of this research were to 1) consult the literature concerned with partnership characteristics that lead to lasting watershed recovery, or sustainable water

management 2) develop an assessment tool, based on the dominant themes found in the sustainable water management literature, and 3) test the tool on a mature local watershed partnership for future revision.

The assessment tool that resulted from this research consists of two items: 1) a self-assessment survey concerned with structural and process elements of a partnership that lead to lasting watershed efforts, and 2) a survey guide that assists watershed management practitioners in understanding survey relevance and exploring their own structures and processes for improvement. These products were then tested and reviewed, which resulted in survey and survey guide revisions, and ultimately a practical and useful watershed partnership assessment tool.

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CHAPTER I INTRODUCTION

Introduction

The collaborative approach to natural resource governance is now a prevalent strategy for managing natural resources, particularly those at landscape levels such as estuaries, watersheds or endangered species across a landscape. Widespread acceptance for collaborative approaches can be attributed to the realization that top-down command and control procedures are no longer effective for the management of complex social-ecological systems. Typically in the form of consensus seeking, locally based partnerships, these collaborative initiatives strive for inclusive and knowledge building collaborative experiences concerning natural resource governance.

These collaborative approaches first developed in the 1980s and 1990s and continue to evolve. Although there has been considerable research on these collaborative approaches (Wondollek & Yaffee, 2000), there has been relatively little research on the sustainability of collaborative institutions over time. As the popularity of these approaches intensified, researchers became increasingly interested in the factors that were responsible for their success or failure. The focus of this thesis is on the sustainability of watershed associations, an important subset of these collaborative approaches to natural resource management. More specifically, this thesis develops and tests an assessment

process designed to assist watershed associations in evaluating the sustainability of their watershed partnership.

The Need for Reform

Initial environmental legislation of the 1970's had significant regulatory teeth and resulted in substantial ecological improvements. The federal government utilized a bureaucratic, top-down, rules and deterrence approach to administer the Clean Air, Clean Water and the Endangered Species Acts. These 'first generation' policies produced positive outcomes, especially with point source pollution intervention. However, the rigid rules and deterrence approaches have increasingly been seen as ineffective in dealing with today's complex problems across landscapes and multiple municipal boundaries (Kettl, 2002). The traditional regulatory approach to environmental management has often been chided for its inability to meet contemporary demands due to its adversarial nature, resulting institutional distrust, complicated prescriptions, inflexibility, fragmentation and high expense (Fiorino, 2006). At the root of these issues is a fundamental flaw of many regulatory designs: the failure to recognize the collective and systemic nature of environmental problems. That is, interventions that neglect to realize the holistic characteristics of social and ecological systems are destined to encounter the same barriers of the past.

Termed "wicked problems" (Scholz & Stiftel, 2005, p.5) due to the complexity of human and natural systems, the environmental challenges of today require policies that reflect the reality that "everything is related to everything

else” (Ostermeier, 1999, p.464). Environmental management of the past functioned under the erroneous assumptions “that ecosystem responses to human use are linear, predictable and controllable” and “that human and natural systems can be treated independently” (Folke et al., 2002, p.437). Common-pool resources such as water are subject to multiple users where one use most likely affects another due to the nature of the resource. In other words, the taking or disturbance of a resource by one user influences the quantity or quality for other users. Therefore, the management of these common-pool resources more often involves arbitrating competing demands for the resources requiring collective action. Adding to the complexity of competing values and goals of users is the uncertain behavior of the interconnected ecological systems. Hence, the past policy approaches of creating “set solutions...through top-down government intervention” (Hajer & Wagenaar, 2003, p. 2) has slowly been replaced with innovative approaches that recognize these connections.

New Institutions

New adaptive institutions have developed to respond to these challenges of complexity, fragmentation and uncertainty present in natural resource management. These institutions utilize adaptive management and address uncertainty and complexity through action, monitoring, and reflection. The resulting governance structure is defined as “a new generation of governance institutions for resolving collective action problems that occur between different

types of resource users”...focusing on the “problem of managing resources when faced with inadequate knowledge and uncertainty about the natural system” (Scholz & Stiftel, 2005, p.4). Now a growing presence in policy processes addressing complex natural resource issues, adaptive governance structures support experimental approaches to management embracing the idea that knowledge is always deficient and shifting, making surprise inevitable so management and policy must maintain flexibility. This flexibility built into policy and management better prepares it to “evolve according to natural dynamics and disturbances as well as social events, economic changes, and political values” (Brunner et al., 2005, p.28). By combining this premise with the human elements of diverse users, different types of knowledge, multiple authorities and numerous organized interests, adaptive governance seeks to produce enduring, sustainable policy solutions.

Watershed Initiatives

Nowhere are “wicked problems” more apparent than in the management of a watershed. In the last two decades, reform of watershed initiatives has matured. These efforts have been given labels such as collaborative watershed group, grassroots watershed organization, community-based watershed effort or coalition, watershed partnership, or watershed partnership, to name only a few. In this thesis, these initiatives will be referred to as watershed partnerships.

Issues surrounding water are among the most significant environmental challenges of our time. Though quantity concerns are increasingly found in the

water conflicts of today, quality was at the forefront of the policy arena during the environmental revolution of the '70's when awareness of natural resource degradation from human activities took center stage. Since the inception of the Clean Water Act, formally known as the Federal Water Pollution Control Act Amendments of 1972, the struggle for quality has enjoyed success from the regulation of point-source pollution. Unfortunately, the continued point-source pollution violations and non-point source problems across landscapes have undercut these successes as many waters continue to deteriorate in quality. The U.S. Environmental Protection Agency (EPA) 303(d) list, a catalogue of streams and lakes that fail to meet quality standards for one or more designated uses, includes nearly 40,000 impaired bodies of water as of 2006. In EPA's assessment they found that 1 in 14 watersheds are "vulnerable to further degradation from pollution, primarily from urban and rural runoff" (EPA 1997, p.1).

Everyone lives, works, and recreates in a watershed and everyday activities of watershed members affect that watershed. This is why there is an increasing emphasis on a collaborative form of policy-making in watershed management. As consensus-seeking institutions, watershed partnerships are congregations of stakeholders who regularly meet to discuss the management of water bodies (Leach & Pelkey, 2001). By 2000, 346 watershed partnerships had been established west of the Mississippi, with 150 of those in California alone (Leach et al., 2002). These initiatives are characterized by their decentralized arrangement, bottom-up decision-making approach that focus on cooperation

with the ultimate goal of improving and sustaining water quality within the watershed (Sabatier, 2005).

The increasing growth of these partnerships is partly due to state and federal agency support in the form of financial assistance. The EPA's Clean Water Act Section 319 and 205 grants, and the Department of Agriculture's Environmental Quality Incentive Program provide funds for these local watershed groups (Leach & Pelkey, 2001). There are other resources increasingly being made available to aid these groups through university outreach programs. The University of Tennessee's Water Resources Research Center, part of the Institute for a Secure and Sustainable Energy, provides a link among water-resource experts, promotes water-resource training and education and establishes and maintains water-related partnerships crucial to effective watershed management (ISSE).

As the popularity and support of these new partnerships increase, so does the need to identify the factors that make these partnerships successful. The desire to learn why some partnerships are resoundingly successful, barely make it, or completely fail extends to facilitators, resource managers, policymakers, interest groups, academics, funding agencies and process participants. Many evaluation methods have been developed so that a partnership's pulse can be taken and lessons can be learned from their success or failure. It has become particularly important to funders, such as the EPA, to be able to assess the progression of a partnership, as it is an investment to the agency. Also,

evaluations raise awareness as to what can be expected from such processes (Conley & Moote, 2003).

Problem Statement

The need for watershed partnership assessments has been established, though critiques of the common forms of evaluation to date have emerged. Many researchers have determined that basing partnership success on participant perception or attained 'deliverables' (tangible outcomes) is problematic and fail to detect process qualities of significance. Participant perception understanding may be useful, but these observations are subject to interpretation and fallible memory and therefore should not be the only basis of determining partnership success. Likewise, focusing on tangible outcomes seems short sighted as a means for declaring success since meaningful partnership progress may not materialize in the form of the typical concrete outcome. Outcome oriented assessments often largely ignore that the realistic nature of the resource, and its social connectedness necessitates a closer look at *how* (processes and structures) partnerships seek outcomes (Patton, 1980). Increased awareness of the complexity inherent in watershed management has guided the thought process that suggests *endurance* of the local watershed partnership as being very significant to long-term watershed improvement. In other words, in addition to be concerned with 'deliverables', there is also an emphasis on sustaining structures and processes that lead to 'deliverables' over time. Christensen et al.

(1996, p.668) ascertain that when evaluating watershed partnerships the “focus is typically on sustaining the delivery of desired goods and services” as opposed to maximizing long-term sustainability. Hence, there is a need for the development of assessments that are concerned with process and structural characteristics that cultivate lasting watershed management.

Research Goal

The goal of this research is to develop a usable tool to help watershed partnerships assess the long-term sustainability of their local watershed partnership efforts. Since true effectiveness is determined by the ability (or inability) to produce desirable lasting effects, a sustainability assessment would be most beneficial. By looking at a partnership’s process and structure, one can assess its capacity to affect the conditions necessary for enduring ecological improvement, therefore enabling leaders to identify the effort’s weaknesses and strengths. This tool, a survey and survey guide, will be concerned with the degree to which a partnership’s process and structure characteristics align with established principles found in the sustainability literature. A path of sustainability for these partnerships further advances their effort to produce solutions to problematic environmental conditions that we face today.

Research Objectives

This research had three principal objectives.

Objective I: Develop a survey as part of the self-assessment tool that helps watershed participants evaluate the long-term sustainability of their partnership.

Survey criteria will be established through an extensive review of the existing sustainable watershed management literature.

Objective II: Test the survey with participants of an existing successful partnership, and improve the survey based on test results. The Beaver Creek Task force has been selected as the successful partnership for testing the tool. Application will involve participants taking the survey and then attending a focus group for survey discussion.

Objective III. Develop a guide to assist practitioners with understanding survey criteria and how to more closely align their process and structure to sustainable principles. This is a necessary element of the Tool as it interprets the sustainability relevance of the survey and provides information of how a partnership can 'operationalize' sustainability principles.

CHAPTER II LITERATURE REVIEW

Introduction

The environmental management landscape has recently experienced the arrival of new institutions that aim to respond to failures of past policies to achieve effective and lasting results in ecological improvement. These institutions recognize that environmental systems “must be considered integral parts of a changing societal system” and that insufficient consideration of societal factors will “seriously jeopardize the effectiveness of development programs and projects” (Loucks & Gladwell, 1999, p.28). Most notably arising around water issues, these institutions come in the form of consensus seeking partnerships and go by labels such as stakeholder partnerships, collaborative efforts, watershed group, or initiatives (Hedelin, 2007). Apprehension about the performance of these collaborative efforts and their products has sparked a search for assessment tools that evaluate a program’s effectiveness.

Watershed Partnership Assessment Tools

As stated earlier, the overall goal of this research to craft an assessment tool for watershed partnership evaluation. The ultimate assessment of a watershed initiative is whether the partnership’s efforts have improved the environmental conditions of said watershed, which may take decades to be

realized. Assessments have therefore sought to capture short-term indicators of success by evaluating organizational characteristics for elements that are thought to result in environmental improvements (Genskow & Born, 2006). Hence, designs for evaluation tools have focused on many dimensions of program success, from assessing democratic participation to judging the perceptions of the actors involved. A major category in tool typology is the outcome assessment. This kind of tool places emphasis on outcomes generated, such as conservation actions, established agreements or behavioral changes. An outcome assessment tool can be as simple as a comparison of results to a program's stated goals. The scale and focus of an assessment tool are fundamental elements that must be determined at the onset of tool construction.

Evaluative tools most often come in the form of outcome assessments. The Program Logic Model (Figure 1) is an outcome assessment tool that is widely used by government agencies, like the EPA, to determine if watershed initiatives seeking 319 funding are investment worthy. The Program Logic Model places ultimate emphasis on outcomes, and is the preferred assessment tool for determining funding qualification situations because it is able to pinpoint tangible results.

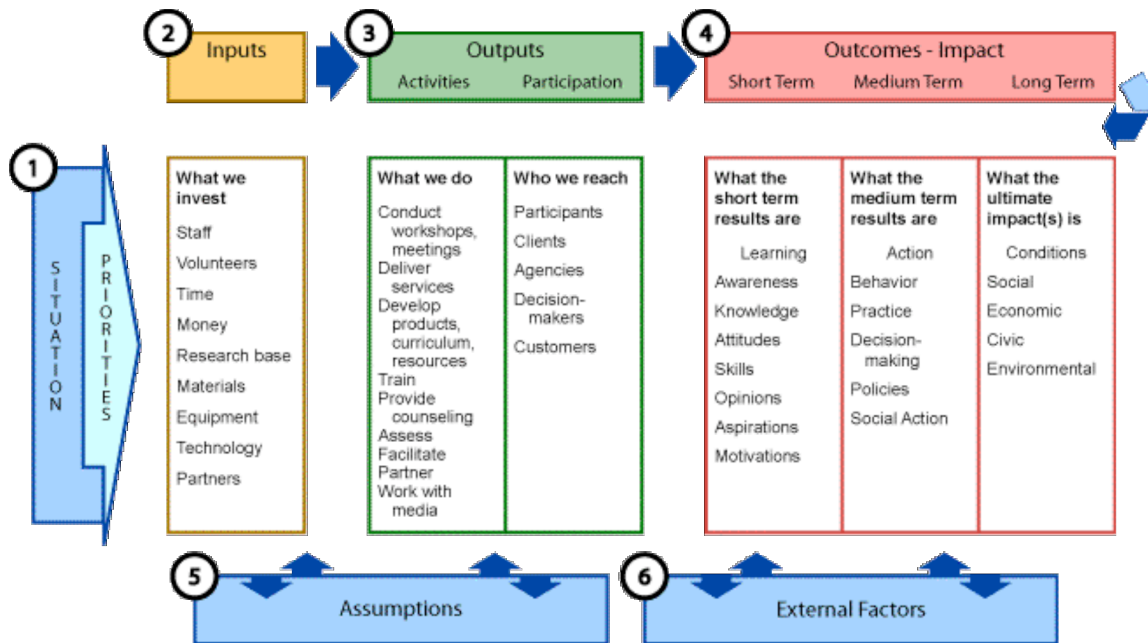


Figure 1

¹Program Logic Model

Notice the flow of the Model from Inputs to Outputs to Outcomes with the emphasis weighted heavily on Outcomes. The Logic Model is intended to be an evaluation working forwards through the model, and a planning tool working backwards through the model. The EPA provides blank Logic Models for programs for planning purposes where intended Outcomes are to be filled out first and from there work backwards.

Termed a ‘black box’ method by Patton (1980), such outcome evaluations are criticized for not allowing evaluators to establish which variables are responsible for an outcome. They typically provide very little insight on process and structure characteristics, and without that analysis “it is impossible to identify *why* the program had or did not have impact” (Knaap & Kim, 1998, p.5). Even

¹ University of Wisconsin Logic Model

though the program may have been funded, this type of model doesn't provide feedback for improvement sake or future program application. For example, a program may list that it conducted public meetings, but what is not exposed is how those meetings were conducted or what came of them. The quality and causality of the actions are largely ignored. It is in the evaluation of the substance of a process that will address major criticisms of collaborative partnerships such as approach effectiveness in addressing power imbalances and/or the perpetuation of narrow interests.

Furthermore, evaluation findings are often based on perception alone. Basing success on "perceived" success is problematic as success may mean different things to different people. This "perceived" success might be assumed upon the meeting of "internally defined goals and objectives" (Hedelin, 2007, p. 152; Conley & Moote, 2003), which aren't necessarily linked to watershed partnership success or sustainable principles (Hedelin, 2007). In the same vein, these evaluations prove narrow in their scope, as this success can only be perceived through produced outcomes in the form of formal agreements and ignore the fact that positive, long-lasting relationships and their understanding were achieved (Buckle & Thomas-Buckle, 1986).

A New Assessment Tool: Sustainability

To be sure, tools such as the Program Logic Model are useful in their own right, still for there to be progress a partnership assessment that provides improvement feedback is more useful. For continuous improvement in the future,

one must look hard at the process and structure of an initiative. The Logic Model is a compliance reality for watershed initiatives to meet funding requirements and can be a valuable planning tool. However a *self*-assessment tool is needed that these watershed partnerships can use as a supplemental device for an in-depth evaluation of the quality of their process and structure.

It is important that a tool be developed in a way that addresses criticisms that have been directed towards tools that are currently available for watershed partnership evaluation. The dominant criticisms that should be taken into consideration in forming a new assessment are 1) focusing on outcomes rather than on the structural and process characteristics responsible for the outcomes or lack thereof and 2) basing success on participant judgments. The significance of these criticisms and how they will be addressed in a new assessment tool is discussed below.

There is increasing pressure on these partnerships to provide concrete evidence of ecological improvement to obtain funding assistance. This is understandable, but young and medium age partnerships are rarely old enough to produce such results. Watershed partnerships, or any other collaborative effort, cannot be viewed as a quick “cure-all” and dialogue regarding their success must focus on what “can and cannot be expected of such processes” (Conley & Moote, 2003, p.382). Short of environmental indicators, an assessment should be looking at a partnership’s structure and process for indicators that *lead* to ecological improvement for sustainable watershed management. For example, watershed improvements such as cattle fencing for

stream exclusion are needed and should be incorporated into a recovery plan if cattle are at all responsible for stream degradation. However, such actions themselves don't necessarily lead to lasting watershed *recovery*. Watershed recovery takes perpetual maintenance; therefore structural characteristics that bolster long-term support and a collaborative process design concerned with social dynamics must be incorporated for sustainable watershed management. Furthermore, by looking at the characteristics of a partnership's structure and process design, an evaluator can determine what actions are responsible for the outcome, thereby addressing Patton's (1980) 'Black Box' reproach.

The capacity of a watershed partnership to produce lasting effects is most appropriately determined through the assessment of structural components and process design. These partnership characteristics indicate whether a partnership is on the sustainable path of arming watershed communities with the necessary tools to accomplish the long-term goal of restoring and maintaining their watershed. It is appropriate, then, to design a self-assessment tool that highlights a partnership's ability to produce lasting effects. One way to do this is to compare structural and procedural elements to established sustainability criteria. Sustainability is a laden term with various definitions that differ in important ways due to context. For the purposes of this research "sustainability" will be defined as concerning "the social arrangements which enable coordinated and effective action to bring about change in the longer term" (Johnson & Wilson, 2000, p.302). Consequently, the self-assessment tool will take on the form of comparative analysis of normative criteria. The premise of comparative analysis

of normative criteria to a program's components requires a deductive approach. In other words, deductive rather than inductive methods are necessary when criteria are derived from theoretical constructs like sustainability. By using this deductive reasoning method the tool responds to the expressed lack of assessment tools that go beyond participant judgment (Hedelin, 2007).

Upon reviewing sustainable development literature, an approach was selected for tool formulation that is grounded in two of the most critical components of sustainable river basin management. Beatrice Hedelin's (2007) twin concepts of *participation* and *integration* will be used to construct the assessment tool. Hedelin's methodology was chosen because it focuses on participation aspects *and* the importance of a holistic (integrated) management approach. This theory was established through broad literature review where both of these concepts are considered "well-established dimensions of both sustainable development and sustainable river basin management, and they are of significant methodological relevance" (Hedelin, 2007, p.151). The process criteria are concerned with how "knowledge and values are integrated into the planning process and how commitment, legitimacy, or acceptance for the resulting plan is generated" (Hedelin, 2007, p.151). Table 1 demonstrates the conceptual break down which is the premise of the Tool. A brief explanation of the criteria can be found in appendix A.

Table 1

Outline of the methodological criteria		
Basic concept	Component	Criterion
		Planning methodologies/processes for sustainable water management must include, support, or promote:
Integration	Across disciplines:	a) integration of knowledge from all relevant disciplines. b) handling of different kinds of uncertainty.
	Across values:	c) identification of the most relevant values in relation to the current issue d) rational argumentation based on relating them to alternative choices in the planning process
Participation	Contributing to the process:	e) inclusion of knowledge owned by relevant actors. f) a procedure for defining the actors that should be involved.
	Generating commitment, legitimacy or acceptance:	g) handling of power asymmetries. h) procedures that ensure that ideological orientations are not suppressed (for consensus-based approaches). i) learning.

CHAPTER III METHODS

Survey Development

Through literature review, questions for a self-assessment survey were developed for each criterion in Table 1. The answers to these questions will provide the information to determine the degree to which that particular criterion is being sustainably addressed by the watershed partnership. The questions were created following the spirit of Hedelin's research. For example, from the 'integration of knowledge of all relevant actors' criterion in table 1, the following two questions were created: what, if any, knowledge outside that of the natural resource field was/is acknowledged? How was/is that knowledge incorporated? All attempts were made during question formulation to keep inquiries realistic as evaluators are often under time restrictions.

Application and Tool Revision

The completed Process Assessment survey was published on the web for application. The survey was assembled in the University of Tennessee's survey builder Dimensions, which is an SPSS (Statistical Package for the Social Sciences) program. This was done to enhance the simplicity for practitioner application in the future and as the means for testing the tool on an existing watershed partnership for revision.

The survey was then applied to an existing watershed partnership for testing. Participants were asked to take the survey and then participate in a focus group where an evaluative discussion about the survey took place. Discussions included survey relevancy, clarity and overall participant perceptions. In addition to providing feedback on the survey as an assessment tool, testing the survey was also done to provide participants with useful feedback on their partnership.

The Beaver Creek Initiative located in North Knox County was chosen for tool application. The Water Quality Forum, an organization that addresses water issues in Knoxville and surrounding counties, formed the Beaver Creek Task Force (BCTF) in 1998. BCTF is an outreach effort whose mission is to “bring together public and private institutions to implement a program to restore Beaver Creek back to a healthy stream that is fully supporting its designated uses by implementing restoration practices and promoting sound economic development”. Since inception, the BCTF has grown to 19 partners including “local, state and federal agencies, local utility districts, and grassroots citizen groups” (BCWRP, 2006, p. 9).

The Beaver Creek watershed (Top orange portion of figure 2, p.21), a component of the Lower Clinch Basin, covers 86 square miles of the northern portion of Knox County. Two of the five communities that it runs through, Gibbs and Karns, are considered to be the most rapidly urbanizing areas in Knox County by the Metropolitan Planning Commission. Not surprising, Beaver Creek is on Tennessee’s 303(d) list of impaired streams with sediment, excess nutrients

and bacteria and pathogens as its main pollutants. A restoration plan has been devised to address the activities that are the sources of this non-point source pollution, which are construction, fertilization, and sewer overflows.

Assessment Survey: Focus Group Preface

The purpose of the focus group was to consult Beaver Creek Task Force active participants regarding the clarity and practicality of the survey. An introduction to the research was presented to the Beaver Creek Task Force at a scheduled monthly meeting. The presentation was intended to familiarize the group with the research behind the survey, and the researcher, so to optimize group participation in completing the survey and participating in the focus group. It was communicated that their participation meant taking the survey online and then attending a focus group where survey clarity and practicality would be analyzed and discussed. Consequently, feedback concerning the survey would also have implications for Survey Guide improvements.

The Assessment Survey Guide

An Assessment Guide was developed for practitioner interpretation of the survey and suggestions. Also developed through sustainable watershed management literature review, the Guide is meant to serve two purposes: 1) to assist practitioners to better understand the criteria and their importance

(relevance) to sustainability and explore potential consequences of how their partnership is currently functioning; and 2) help practitioners to better understand ways to more fully embrace the sustainable criteria and potential consequences of more fully embracing the criteria in their watershed partnership. The guide was developed with user-friendliness in mind and provides explanation regarding survey questions for each criterion and their significance in terms of sustainability. Suggestions and watershed partnership resource links are offered for possible partnership improvement.

Practitioners were asked to review the guide and provide feedback in terms of comprehensibility, flow and possible additions. Practitioner feedback was then taken into consideration for guide revisions. Feedback from practitioners is considered valuable advice and was implemented into the guide if the suggestions are viewed as further improving the Assessment Guide.

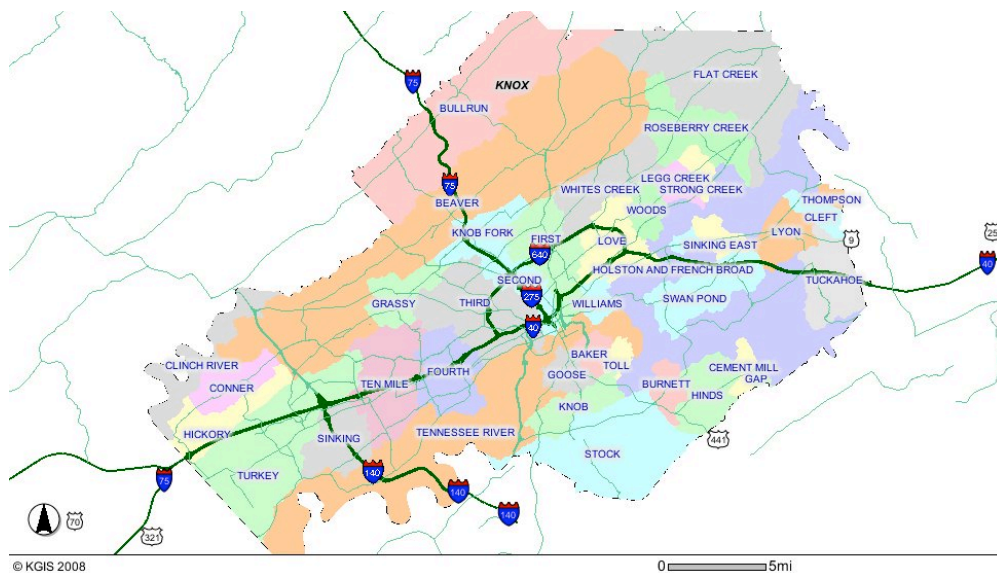


Figure 2 Knox County Watersheds

CHAPTER IV RESULTS

Overview

The goal of this research was to develop a self-assessment tool to help watershed participants evaluate the long-term sustainability of their actions. Research results to meet that goal and thesis objectives are discussed below in the following sections:

I) **Literature Review** to develop the assessment survey. Survey criteria were developed through an extensive review of the existing sustainable development literature

II) **Assessment Survey** discussion of the survey goals and structure (See Appendix B for the Assessment Survey)

Assessment Survey Focus Group and **Implications** articulates the purpose and goal of the focus group and its implications for the survey

III) **Assessment Survey Guide**

Guide Introduction explains guide purpose (See Appendix C for Assessment Survey Guide).

Focus Group Implications concerning the Guide for revision

Practitioner Review Implications for the Guide for revision

I) Literature Review for Survey

A distinctive hallmark of collaborative natural resource management is the incorporation of a participatory process. It has become clear that water issues cannot be addressed without acknowledging that the health of a watershed is highly dependent on a range of human activities (Hedelin, 2007). A strong participatory element has therefore been incorporated in water management collaboration. Evaluations of these efforts, therefore, often focus on the quality of participatory characteristics such as representation or decision-making approach (Conley & Moote, 2003). Also a common theme in sustainable development literature, robust participation has been viewed as an effective means for building knowledge, trust, and awareness among watershed communities, all of which increase community capacity to deal with change and uncertainty for resilience (Folke et al., 2005).

Another outcome of participatory activities is community cohesion and mutual understanding, or social capital, which has also been identified as a precursor to building the resilience for sustainable efforts. By building resilience through increasing civic ability to respond to uncertainty and change and produce social capital, partnerships take advantage of sustainable development research which has made “substantial progress in understanding the social dimension of ecosystem management (Folke et al., 2005, p.444).

A new evaluative methodology (Hedelin 2007) that is concerned with comparing process and structural dynamics to sustainable criteria recognizes the

importance of participation as just discussed. Although Hedelin acknowledges participation as a necessary element of collaborative partnerships, the author insists that it alone is insufficient for sustainable watershed management. Thus, another component of the sustainable concept was incorporated in the methodological criteria: Integration. Through extensive literature review, Hedelin (2007) uncovered the reoccurring theme of integration noting that “practicing sustainable river basin management implies taking into account the full breadth of ecological and socioeconomic factors that are connected with water resources” (p.154). This holistic management approach means attempting to incorporate all possible linkages across disciplines and values as part of watershed partnership planning. The concept of integrating relevant disciplines and local knowledge “is by far the most referred to by current water professionals, academics and other experts” as an important dimension of sustainable efforts (Hedelin, 2007).

The purpose of this research is to create an assessment tool, a self-assessment survey and survey guide, which is concerned with the capacity of local watershed partnerships to achieve long-term (sustainable) results. Hence, the criteria created (below) were derived from Hedelin’s sustainability methodology. Criteria following this section are not identical to Hedelin’s criteria, but rather capture the essence of her thesis. Their appearance differs because the products from this research needed to take on a more operational form for practitioners than Hedelin’s theoretical framework.

Developed criteria follow the theme that for a partnership to achieve a high degree of social capital and maintain the capacity to deal with uncertainty and change for resilience they must be concerned with the integration and participation aspects of their process and structure. The first of five criteria is structural while the others are more focused on process characteristics. The five criteria are: *The Watershed Partnership, Its Representativeness, & Support; Framing, Deliberating, & Negotiating; Information & Knowledge; Monitoring, Learning and Adapting; and Outreach*. The assessment survey responses are in the form of the Five Point Likert Scale or list (only in Criteria I: question #3). See in Appendix B. the complete survey.

The Watershed Partnership, Its Representativeness, & Support

Governance Balance: Flexibility

In European Union water planning, local watershed partnerships are part of the government structure of watershed management. In such cases, they have found significant benefits to a decentralized structure with considerable governance authority at local levels (Pahl-Wostl et al., 2007). Decentralization refers to the devolution of state resources or authority to local decision-making bodies (Lane, 2003). The idea is that social-ecological systems are too complex for the command and control management technique characteristic of central organizations, like state or federal government. Also, centralized approaches typically get weighed down in the status quo conventional bureaucracy (Pahl-

Wostl et al., 2007). Yet, research has shown that a balance between centralized and decentralized structures can create favorable conditions and “in the absence of institutionalization, collaborative platforms are not sustainable because they are very vulnerable to changes in membership or leadership” (Pahl-Wostl et al., 2007, p.9). Folke et al. (2005, p.463) articulates that the mix is “neither centralization nor decentralization but cross-level interactions”. By fostering some government involvement, partnerships can take advantage of technical and financial assistance. In addition, by working with government agencies, partnerships are more able to generate policy change beneficial to watershed health.

Survey question generated:

The watershed partnership has acquired or is open to receiving federal and/or state government financial and technical assistance.

Representation Procedure

Within the watershed literature there is overwhelming consensus that it is important to include all relevant actors in the decision-making process of a watershed partnership. A common theme discussed is that the complexity of the issues surrounding watershed management cannot be confronted without stakeholder information, perception and collaboration (Pahl-Wostl et al., 2007). The quality of agreements is affected if stakeholders are not there to offer the unique knowledge about their interests and problem analysis that is understood only by them (Innes and Booher, 1999). Ravnborg and Guerrero (1999, p.264)

insist, “For a platform to be an effective negotiating body, *all* stakeholders relevant to the problem or resource in issue must be represented”. Also, watershed partnership proceedings need to be seen as legitimate democratic processes. Fairness and equity must be perceived for the effort to be useful and build trust (social capital) (Pahl-Wostl et al., 2007). Furthermore, excluding stakeholders may lead to ‘non-participant’ rejection of agreements since they were not at the negotiating table (Lubell & Leach, 2005). To ensure all stakeholders are included, a purposive course of action that functions as stakeholder detection exclusively is recommended. In other words, a procedure that focuses on who should be involved needs to be in place.

Survey questions generated:

All stakeholder interests checked above are represented (a person or group that speaks for the particular interest) in watershed partnership dialogue and decisions.

A thoughtful and well-articulated process was used to identify participants and stakeholders who should be involved in the watershed partnership.

Bridging Institutions: Support & Social learning

Institutional integration can benefit watershed partnerships in many ways. Organizational bridging can afford partnerships’ with monetary assistance, policy advising, technical services, ecological monitoring aid, and political backing. Enlistment from institutions responsible for the system degradation may be a potentially beneficial bridge. For example, stormwater discharges from utility districts may be a point source pollutant in some watersheds. In many cases facilities such as these have received violations regarding their non-compliance

with discharge standards. Watershed partnerships and utility districts can together work towards a common goal. These kinds of resources are invaluable to partnerships. Leach & Pelkey (2001) found that a partnership's odds of success significantly increase if the group has acquired adequate resources. Folk et al. (2005, p.464) emphasizes the "role of multilevel social partnerships to generate and transfer knowledge and develop social capital as well as legal, political, and financial support to ecosystem management initiatives". They add that connecting agencies and cooperatives do not just assemble resources, build knowledge and establish trust, but also facilitate the communication, translation, and mediation of "scientific knowledge to make it relevant to policy and action".

The International Council for Science (ICSU) in a series on Science for Sustainable Development (2002, p.19) stressed that support enhances the adaptive capacity of watershed partnerships. A key focus of the series stresses the importance of nurturing diversity to foster resilience. The report maintains that "Diversity and an apparent redundancy of institutions (in the sense of overlapping functions) appears to play a central role in absorbing disturbances, spreading risks, creating novelty and reorganizing following disturbances". Accumulated knowledge, understanding and awareness that is individually accrued and then shared, builds a strong knowledge base. Enhancing the knowledge base better arms partnerships with the ability to relate and respond to feedback on a smaller scale instead of having to deal with larger scale disturbances later.

It is one thing to create organizational links and another to keep them.

Sustaining the bridge relationships is imperative to be able to reap the benefits of these connections. Maintaining these relationships will preserve the collective memory of the partnership so to draw from experiences (ICSU 2002).

Furthermore, changes in organizational participation may lead to an erosion of trust within the partnership (Imperial, 2005). Mostert et al. (2007) found that continued high engagement and level of commitment among participants and leaders is key to fostering social learning.

Survey questions generated:

The watershed partnership has partnered with various institutions to obtain a sufficient level of all legal, financial, political, & technical support.

Partners from various institutions maintain a sufficient level of interaction for effective communication with watershed participants.

Framing, deliberating and negotiating

Framing and Mindset

How discussions are framed can greatly influence the quality of a participatory process. A quality participatory process is concerned with collaborative interactions for productive discourse and social learning. In their research on watershed partnerships, Diduck & Sinclair (2002) found that how discussions are framed can be a barrier to participation. If discussions are not structured in a way that promotes collaboration, miscommunication and conflict may drive participants away from the process (Pahl-Wostl et al., 2007). It is imperative to promote a teamwork atmosphere that focuses on creating win-win solutions and “invest in ‘building common ground between the seemingly

opposing frames” (Mostert et al., 2007, p.12). Also, fostering cooperation can create a more conducive learning environment for increased participant awareness of the issues and mutual understanding.

A ‘watershed mindset’ is one that encourages participants to view a watershed process in a realistic fashion. The nature of the resource and its connectedness necessitates that participants be comfortable with long-term and experimental actions, including the acceptance of the best available science. Fostering a ‘watershed mindset’ is central in maintaining levels of commitment as participants without it can easily lose faith and patience with the process. Hence, leaders need not overlook the significance of managing expectations to sustain confidence and develop trust. It is important to ask: What are the main contextual components of the situation that needs to be decided, and what is a reasonable to expect out of this process (Gregory, 2000)? Managing for realistic expectations requires that leaders shape attitudes to accept the nature of watershed restoration and uncertainty of the resource (Petts, 2006). Christensen et al (1996, p.682) notice the unrealistic expectations from the public of managers and scientists. They add that “it will be unlikely that society will accept ‘science as a model for ecosystem management’ in the absence of a clearer understanding of the importance of uncertainty to both science and management.

Survey questions generated:

Issues are framed in a manner that encourages collaborative approaches as opposed to promoting a sense of rivalry between stakeholders.

Participants realize that watershed management is a long-term process characterized by on-going actions.

Participants are aware of the uncertainty common in watershed management and are therefore comfortable with experimental policy i.e. learning and revising 'as you go'.

Deliberating and Negotiating

Many collaborative institutions emphasize the significance of consensus-based approaches in their deliberating and negotiating processes (Wondolleck & Yaffee, 2000). Employing consensus-based approaches in decision making implies that a partnership wishes to transcend symbolic participation. This form of democracy means that participants have the power to influence decisions. Empowering the citizenry in such a way promotes the perception of fairness and enhances conflict resolution abilities (Lubell & Leach, 2005). Moreover, allowing participants to influence outcomes provides a sense of ownership and may facilitate a sense of social responsibility for its implementation (Leach, 2006).

Survey question generated:

Major decisions concerning important issues are made by consensus.

Providing Platforms and Facilitation to Foster Dialogue

It is important to create an environment in which participants are more inclined to abandon established positions and learn from others (Folke et al., 2005). Because “actors typically have to collaborate by transgressing institutional boundaries, trust cannot be assumed”, therefore “politics and policymaking is not simply about finding solutions for pressing problems, it is as much about finding formats that generate trust”...which is a “key variable that we

have taken for granted for a long time” (Hajer & Wagenaar, 2003, p.12). Some form of facilitation for negotiation mediation is critical to keep things moving in a balanced way that maintains confidence in the collaborative process. Ravnborg & Guerrero (1999, p.265) express the importance of third party facilitators given “conflicts relating to watershed management are often sensitive and are likely to be nested in a web of social relations. Effective facilitation involves successfully managing conflicts and making participants feel comfortable expressing their opinion (Wondolleck & Yaffee, 2000).

Survey questions generated:

Some form of facilitation is employed during deliberation and negotiation processes.

Participants feel comfortable expressing their opinion during deliberation and negotiation processes.

Rational Discourse: Scenario Building and Learning

Managing for effective deliberation not only creates a favorable atmosphere for quality decision-making, but also facilitates a unique learning environment. Learning is crucial for achieving the ability to build resilience (Pahl-Wostl, 2007). According to Hedelin (2007, p.159), learning is an outcome of rational discourse because “during the process, actors can learn both about the different aspects of the natural system and about the various values and perspectives involved”. Rational discourse also referred to as value structuring or double-loop learning is a consensus-based technique that is an effective component of deliberation in a collaborative process. Gregory (2000, p.2)

explains value-structuring as a “multi-attribute utility theory that focuses on ways to identify and measure stakeholder values, to develop information that characterizes the anticipated consequences of options, to establish tradeoffs across conflicting objectives, and to link these results to support for specified alternatives.” Brainstorming or scenario building in this way can help participants relate to each other and find common interests leading to ‘ah-ha’ moments of mutual understanding (Hajer & Wagenaar, 2003). Participants are then enlightened and move “beyond individual self-interest to a consideration of the public good, the promotion of a common identity, and a sense of shared responsibility” (Paxton, 1999, p.103).

Survey questions generated:

All values within the watershed are considered in the exploration of alternative choices when making important decisions.

When considering actions--such as a new subdivision--that will impact the watershed, most participants respect differing values and interests and are willing to discuss the impacts of actions from multiple perspectives.

Partnership Function: Data, knowledge and information

Whole System Knowledge

Many authors stress the importance of including all relevant disciplines in the planning process of watershed management. According to Gunderson and Holling (2002, p.8), “One way to generate more robust foundations for sustainable decision-making is to search for integrative theories that combine

disciplinary strengths while filling disciplinary gaps”. Since the resource is connected to a range of societal factors, it is necessary to incorporate all appropriate fields in decision making for sustainable efforts. Water engineers alone cannot produce sustainable solutions to the complex issues surrounding watershed ills.

Equally important is the inclusion of the generationally accumulated local and contextual knowledge about the resource (ICSU 2002). The unique local ecosystem awareness of indigenous people “can be invaluable for policy-making” (Lubell & Leach, 2005, p.9). Lay knowledge makes a significant contribution towards understanding the dynamics of the *whole* system as they are intimately linked to the resource (Folke et al., 2005). This knowledge and understanding of system dynamics “needs to become embedded in a partnership of institutions that can interpret and respond to environmental feedback (Olsson & Folke, 2001, p.86). Expanding comprehension of complex ecosystem characteristics in this way further advances a partnerships’ ability to adapt to change (Berkes and Folke, 1998).

Survey questions generated:

All relevant fields of knowledge are included in data analysis and management regarding the watershed.

The partnership makes good attempts to capture local context and knowledge involving the biophysical and social dynamics within the community.

Interaction Interpretation

Data can be managed and communicated in ways that demonstrate the interconnectedness of ecological/social systems. This holistic understanding includes knowledge about “how ecosystem elements of the watershed (both biophysical and socioeconomic) interact; how the watershed got to its current condition (socioeconomic and biophysical conditions)” and how the “activities that would improve, restore, or halt the decline of aquatic and terrestrial processes and conditions in the watershed” (Fight et al., 2000, p.5) can be included.

Finding ways to successfully demonstrate these connections, such as concept maps, would be beneficial to partnerships and its members (EPA, 1997).

Survey question generated:

Data is analyzed, managed, and communicated in ways that inform participants about the connections and interactions across economic, social and environmental landscapes.

Accessibility and Comprehension

Information deficiencies are often cited as obstacles to stakeholder engagement and sustained participation (Mostert et al., 2007). Aspects of the problem consist of “inaccessible information, overly technical discourses, and incomplete information” (Diduck & Sinclair, 2002, p.3). These are complex issues that require leadership to make information easily accessible and communicate the information in creative ways that resonate with participants.

Survey questions generated:

Citizens of the watershed can easily access data from various fields of knowledge (i.e. soil testing, mapping etc.).

Data are maintained and communicated in ways that can be easily understood by participants.

Monitoring, learning and adapting

Monitoring activities inform decisions, effectively demonstrate attribution concerning connectedness between ecosystem dynamics and human activities, and contribute to the effort to build social capital. According to Folke et al. (2005, 463), “successful management is characterized by continuous testing, monitoring, and reevaluation to enhance adaptive responses, acknowledging the inherent uncertainty in complex systems”. Collecting data, processing information and managing facts concerning projects and other efforts contributes to efficiency and social learning. Establishing realistic indicators that identify discrepancies between what wanted to be accomplished versus what has been accomplished is the first step in a monitoring process (Boyle et al., 2001).

Monitoring actions have positive implications for learning. Learning through action creates opportunities for social gathering that in turn fosters relationship building (social capital). However, a partnership must go beyond compliance monitoring (typically required for funding from agencies) to include a monitoring plan so to capture these benefits (ICSU, 2002). There is the act of monitoring and there is the act of communicating monitoring results. By communicating monitoring results (feedback) effectively to participants, partnerships increase the ecosystem knowledge base. Olsson & Folke (2001,

p.87) indicate that “active management choices and social arrangements that are more in tune with ecosystem dynamics and that increase adaptive capacity...can improve the chances for building social-ecological resilience.” Also, by incorporating feedback processes from monitoring analysis, partnerships’ produce sustained action-learning cycles (Johnson & Wilson, 2000). This feedback loop displays the cause and effect relationship of the actions of the partnership. It is important that participants understand the reasons for the outcome; this ensures better acceptance for adapting (see next section).

Survey questions generated:

Monitoring watershed conditions and impacts of partnership actions is a top priority for the watershed partnership.

Realistic key performance environmental indicators have been established as measures of success or failure as part of monitoring activities.

Monitoring is considered and treated as a learning tool for improvement in addition to a compliance test to determine project fulfillment.

Partnership participants are made aware of monitoring activities and are informed of the results on a regular basis.

Relationships among watershed participants have improved as a result of working together on monitoring activities.

Monitoring observations are communicated in a way that participants are able to comprehend and therefore can contribute to discussions on implications.

Due to monitoring and its communication, a better understanding of the effort’s course of action and watershed dynamics has become apparent to watershed participants.

As a result of monitoring communication, participants are gaining a greater understanding of the inherent uncertainty of ecological systems.

Because of their engagement in monitoring results, participants are better able to evaluate the partnership and its impact on watershed conditions.

Adapting

In order to learn from experience, partnerships must evaluate, reflect, and adapt through effective watershed responses. According to Olsson & Folk (2001, p.85) “the ability to adjust institutions to changing environmental conditions is likely to become increasingly significant in a world of growing uncertainty and surprise.” Objectives and goals should be constantly revisited and adjusted if needed and participants should be regularly updated so to adapt to the changing conditions. Folk et al. (2005, p.451) claim that “leadership is essential in shaping change and reorganization by providing innovation in order to achieve the flexibility needed to deal with ecosystem dynamics.” The ability of leaders to frame and *reframe* the problem is critical as it influences the overall learning and deliberation process.

Survey question generated:

The partnership has re-evaluated and made changes for improvement due to the learning that has occurred through monitoring.

Volunteer Monitoring

Engaging the public through monitoring programs is an opportunity to expand the community’s resource knowledge, awareness of partnership actions and social capital. Larson and Lach (2008, p.829) insist that watershed groups would benefit from involving residents in restoration projects and monitoring as it is important to empower them “to undertake and participate in resource protection”. Expanding this task to public volunteers will provide a sense of ownership that helps sustain commitment for watershed efforts. Also,

experiences from monitoring activities can promote a greater appreciation for ecosystem dynamics and ambiguity, which may facilitate a more realistic frame concerning watershed management.

Survey question generated:

The partnership has included a volunteer monitoring program as part of monitoring activities.

Outreach: Awareness & Knowledge

Building Resource Knowledge

For a partnership to produce sustainable efforts, it must educate the general public. Not all citizens can be active participants and intimately involved in the collaborative process. It is important that the community be exposed to some understanding of the ecological system and how it is altered (Sneddon et al., 2002). Often, a major source of sediment loading comes from the residential sector. Since non-point source pollution is difficult to regulate a partnership must arm the community with the corollary knowledge of their actions. Citizens inherently want to do the right thing for their community, but they are typically not informed about ecological principals important in watersheds.

Survey questions generated:

An outreach plan has been devised and implemented.

Partnership outreach includes community education about the watershed.

Outreach products include general information about watershed principles and human-environment linkages within the watershed.

Establishing Community Presence and Building Awareness

Creating a shared appreciation of place gives a community a sense of pride for what is theirs and enhances the feeling of responsibility required for watershed health. Pavey (2005, p.32) indicates, “empowering local communities is at the heart of collective action theories”. Providing opportunities for the community to interact in a watershed project setting fosters institutional identity, resource understanding, and social capital. Something as simple as a bumper sticker can create awareness. Seth Diamond of the Beartree Challenge partnership commented that the logo now on hats around the community “Institutionalized” them, meaning he felt that the partnership had reached the level of exposure that symbolized legitimacy (Wondolleck & Yaffee, 2000). Partnership leadership accessibility and exposure within the community is another approach to establishing presence creating awareness.

Survey questions generated:

The community is encouraged to be a part of restoration activities carried out by the partnership.

Outreach products have been successful in promoting awareness about watershed dynamics and about partnership activities.

The broader community has access to watershed staff/volunteers regarding questions or assistance.

Youth outreach

Involving youth in watershed activities and education not only enhances their understanding of ecological processes, but also provides them with the

skills and knowledge to make responsible land-use decisions as future community decision makers, strengthens their local identity, and builds resilience. Krasny et al. (2009, p.1) note that participatory approaches to education “create situations where, through ongoing interactions with the social and ecological elements of the larger system, students develop the capacity to play a meaningful role in shaping their own future and that of their larger community”. Bringing them out of the classroom and into a learning environment that illustrates real world issues may inspire students to make important changes individually and within their community (Stapp, 2000). Educational activities, as such, also function as opportunities for community interaction and mobilize support for the cause (EPA, 2001). Furthermore, students are often eager and creative in finding ways to promote messages of interest (Stapp, 2000). By creating an educator in a student, partnerships create critically thinking youth that then pass that on (Krasny et al., 2009).

Survey questions generated:

Youth education is incorporated in watershed partnership outreach.

Interactive learning, a hands-on approach that goes beyond learning by observation (passive learning), is included in such youth education.

II) Assessment Survey

Goals and Structure

The goal of the survey product, which has been given the name *The Watershed Partnership Sustainability Assessment Survey (SAS)*, was to establish an instrument that captured the dominant themes within the sustainable water management literature discussed in the previous section. The survey is broken up into the five major criteria: *The Watershed Partnership, Its Representativeness, & Support, Framing, Deliberating, & Negotiating, Information & Knowledge, Monitoring, learning and adapting, and Outreach*. The following section covers the implications from the focus group, which was performed to test the survey for clarity and practicality. As discussed in methods (p.20), the survey was built online and taken by selected participants from the Beaver Creek Task Force. Participants then attended a focus group where feedback on the survey was delivered.

Focus Group Implications

The content of this section contains feedback from the focus group that resulted in survey modification. First is a brief discussion covering their general perspectives of the survey, and then individual survey question revisions follow based on their feedback. Only the survey questions that needed clarification or

any other improvement are discussed below. Survey questions not discussed were perceived as clear and reasonable. Questions below are listed first in the exact form that the participants viewed when they took the survey. After the feedback is discussed, the revised form of the survey question is noted. See Appendix B for the complete Survey.

General feedback

The general sentiment of the survey regarding its practicality and perceived usefulness was positive. Participants expressed the relative ease concerning effort and time expenditure in taking the survey. If the survey is too complicated and/or time consuming then the practicality of it would be in question. According to the group, approximate time to take the survey was around 10 minutes. Practitioners also indicated that taking the survey was very useful for them. Dialogue that transpired from completing the survey revealed topics that evidently need to be explored among Task Force members. Finally, participants who work with watershed partnerships other than just the Beaver Creek Task Force seemed approving and eager to apply the survey to other existing partnerships. Clearly an impression of usefulness from active practitioners was strongly desired and a valuable observation.

Individual Question's and their Revisions

Criteria I: The Watershed Partnership, Its Representativeness, & Support.

1. The watershed partnership has acquired or is open to receiving federal and/or state assistance.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

Feedback: This question was interpreted as willingness to receive federal and or state government dollars only. The question was therefore revised to reflect that technical assistance was intended to be considered in addition to financial assistance:

1. REVISED: The watershed partnership has acquired or is open to receiving federal and/or state financial and technical assistance.

Criteria I: The Watershed Partnership, Its Representativeness, & Support.

3. From the list below, please check the interests that are valued by citizens within your particular watershed.

- ☐ Conservation
- ☐ Recreation
- ☐ Aesthetics
- ☐ Water Quality
- ☐ Development
- ☐ Industry
- ☐ Private Landowners
- ☐ Municipal Service
- ☐ Other _____

Feedback: It was articulated that the “municipal service” response option may be too vague. Participants were confused as to whether the option included

services or officials or both. “Municipal service” was therefore clarified and “elected officials” was added.

3. REVISED: From the list below, please check the interests that are valued by citizens within your particular watershed.

- ☐ Conservation
- ☐ Recreation
- ☐ Aesthetics
- ☐ Water Quality
- ☐ Development
- ☐ Industry
- ☐ Private Landowners
- ☐ Municipal Service (Utilities, stormwater, infrastructure)
- ☐ Elected officials
- ☐ Business Owners
- ☐ Other _____

Criteria II: How does the partnership function: Framing, Deliberating, & Negotiating

7. When considering actions--such as a new subdivision--that will impact the watershed, most participants understand the importance of discussing the impacts from multiple perspectives reflecting diverse values and interests.

Feedback: This question resulted in largely neutral responses. According to the group, they just didn’t fully understand it and after a detailed explanation of the intent of the question, the following revision was suggested for better respondent resonance. Since the suggested revision did not change the essence of the original question, it was accepted.

7. REVISED: When considering actions--such as a new subdivision--that will impact the watershed, most participants respect differing values and interests and are willing to discuss the impacts of actions from multiple perspectives.

Criteria IV: Monitoring, learning and adapting

11. Monitoring is NOT exclusively performed by government agencies and/or paid watershed staff.

Feedback: After a thoughtful discussion of what non-government and unpaid monitoring effort means, it was concluded that a better way to ask this question due to its intent was to specifically use the term 'volunteer monitoring'.

11. REVISED: The partnership has included a volunteer monitoring program as part of monitoring activities.

III) Assessment Guide

Purpose

The survey and companion guide has been developed for watershed-based partnerships interested in producing sustainable efforts. The guide was designed to capture the common themes within the sustainable water management literature that address this interest. The purpose of the assessment guide, *The Watershed Partnership Sustainability Assessment Survey (SAS) Guide*, is 1) to assist practitioners in better understanding the criteria and their importance (relevance) to sustainability and explore potential consequences of how their partnership is currently functioning; and 2) to help practitioners better understand ways to more fully embrace the sustainable criteria, and in their watershed partnership. The guide is sectioned into the five criteria: *The Watershed Partnership, Its representativeness, & support; Framing, deliberating, & negotiating; Information & knowledge; Monitoring, learning &*

adapting; and *Outreach*. Sections provide a discussion of each criterion including operational suggestions for practitioners.

Feedback concerning the guide was received from practitioners who reviewed the material and, consequently, the survey focus group. Although emphasis was placed on discussing the Survey in the focus group, comments generated from the analysis of certain questions proved significant for the Assessment Guide as well. Below is a brief discussion on the material included in the Guide due to important remarks made in the focus group *and* revisions from the Guide practitioner review. See appendix C for the Assessment Guide.

Focus Group Implications

Criteria II: Framing

Comments that prompted the additional remarks in the Criteria II Framing section were actually made during a discussion about the Monitoring section. Dialogue between participants revealed that the public seems to be hesitant about accepting monitoring results. This could be due to a lack of public understanding of the uncertainty of the resource and the realities of what monitoring can produce. Hence, incorporated into the framing section was a public framing recommendation that focus's specifically on building confidence within the community for partnership monitoring activities.

Criteria III. Relevant fields of knowledge

The discussion of the question pertaining to ensuring all relevant fields of knowledge are included was met with apprehension. Participants felt that

practitioners may not know all the fields that should be integrated into decision processes. A useful list was placed in the guide that could serve to prompt thought and discussion about what disciplines *should* be involved and what disciplines *are* involved. Below is the list of disciplines to consider that was added into the Guide.

Added a list

Natural Resources Agriculture

* Water Engineering * Resource Economics

* Forest Management * Crop Technologies

* Wetland Ecology * Irrigation Management

* Terrestrial Ecology * Soil Management

* Riparian Systems * Humanities

* Fisheries Biology * Policy Development

* Aquaculture * Multicultural Specialties

* Wildlife Biology * Architecture

* Geographic Information Systems * Planning

* Landscape Classification * Anthropology

* Landscape Ecology * Gender Issues

* Grazing Management * Community Development

* Geomorphology * Group Processing

* Soil Science

* Water Quality

<http://www.ecosystemsciences.com/>

Criteria IV. Monitoring

As a conversation unfolded about monitoring and who should be involved, it became apparent that the Monitoring, learning and adapting section of the Guide should contain a passage that furthered the justification for the inclusion of a volunteer monitoring program. Participants argued that they could not accept monitoring data from citizens due to the complex nature of the task and validity of

untrained collector findings. Therefore, benefits of a volunteer monitoring program that go beyond the actual data collection results were deliberately placed into the Monitoring, learning and adapting introduction.

Criteria V. Outreach

Focus group participants gave many neutral responses to the Outreach question concerning the success of their products in promoting watershed dynamic awareness and partnership activities. Their reasoning was that they had not quantitatively measured this success and questioned how they would do it. Even though their response was consistent with the kind of exploration that is meant to come out of the Tool, a resource to evaluate outreach products seemed like a useful addition to the Guide.

Practitioner Review Implications

Practitioners affiliated with the Water Resource Research Center at the University of Tennessee and Tennessee Valley Authority were selected to review the Assessment Guide. Overall, practitioners responded positively to the Assessment Guide material in terms of usefulness and layout in terms of user friendliness. Suggestions other than minor word edits, additional link recommendations and term clarification are listed below. Critiques regarding improving usefulness included further developing the comprehensibility of 1) how to use the Guide and 2) heading delineation. Both of these concerns were

addressed in the introduction of the Guide. Also expressed was 3) the desire to see a stronger argument within the discussion of Criteria V Outreach, stressing the importance of involving the community in actions such as restoration activities. This suggestion was implemented accordingly.

Chapter V

Concluding Remarks

From a distillation of the literature, I developed and tested a survey with the goal for it to be used as a self-assessment tool to help watershed-based groups achieve lasting results concerning the health of their watershed. Although it is difficult to transform concepts from research literature into practical results, I am confident that my distillation resulted in capturing the essential themes at the heart of sustainable water basin management. From this literature, I chose Hedelin's 2007 *Criteria for the Assessment of Sustainable Water Management*, as the basis for developing the tool. Hedelin acknowledges that the criteria derived through her research are not intended to be used as a practical guide by watershed practitioners. However, recognizing the value of her research and need for watershed assessment and planning methodologies to move in this direction, I steered my research toward developing a more functional version of her and other sustainability researchers efforts. The process of neatly separating the innately connected themes in a way that would resonate with practitioners while remaining true to the literature proved challenging. A flow chart was created from the major themes in the literature, which helped me visualize the themes, how they are connected to each other, and their potential use as the basis of an assessment survey. From this flow chart, I built the survey questions, which were then arranged into groups with titles, hence the five criteria. Although the criteria appear to take on a different form than Hedelin's, they emulate her criteria and the essence of the sustainability literature.

As stated above, I am confident that the survey inquiries correspond with sustainable ideals discussed in the literature concerning enduring watershed management. That said, I do not claim that these thesis products represent a comprehensive inventory of what may or may not lead to lasting partnership efforts. Due to the uncertainty and complexity of water systems, lasting improvements can only occur with sustained efforts. Because of this, established criteria for this research were developed from the sustainability literature concerning watershed partnerships. However, there may be other areas of study, organizational effectiveness for example, that may merit additional research.

I am apprehensive about what *cannot be* included in the assessment survey. I believe that our capacity to sustain efforts involving water resource health will continue to be somewhat compromised until there is a widespread shift in societal value structuring. This is obviously a larger issue than any thesis can address, but this limitation needs to be mentioned in research such as this work. A realistic way that watershed partnerships can address this limitation is to shape public perception by raising awareness through social marketing. Social marketing is briefly discussed in the Guide and if executed properly, can be useful in raising awareness concerning watershed health. To date, though, existing social marketing resources that focus on water resource issues are limited. Effective social marketing does have the potential to change citizen behavior. However, more research is needed to help guide social marketing aimed at watershed improvement.

On a local watershed partnership scale, I am optimistic about what the tool developed in this research can accomplish. What transpired in the survey focus group secured my belief that its content could act as an impetus to advance watershed discussions toward producing sustainable efforts. Survey question analyses instigated several useful discussions among focus group participants concerning how they could improve their management strategies. Also, constructing the survey on a web-based survey builder proved appropriate as the participants were comfortable with this form which will facilitate future use due to its accessibility and user-friendly arrangement. As for the guide, its development, which involved transforming the fruits of sustainable research into an operational form, proved challenging. I feel the practical translation was successful as the reviews from practitioners were encouraging. Feedback affirmed that the finalized version of the guide, meaning the guide with incorporated suggestions, would fulfill its objectives.

Researcher's Note

Assessment survey findings are not intended to be used to declare partnership success or failure. The purpose of the survey and survey guide is to assist partnerships in the exploration of their structure and processes for improvement purposes. Although survey results are based on participant judgment, a criticized method of assessment, survey questions are purposeful instead of random queries of perceived success or failure. Most important,

though, is that the tool is a *self*-assessment that is not particularly concerned with success or failure, but rather with the improvements that come of such assessments. What makes this tool somewhat unique is that it is meant to serve as an impetus for thoughtful dialogue concerning watershed partnerships. The desired effect of this tool is for it to instigate further discussion among watershed participants regarding the sustainability of their watershed efforts. The survey and the guide are the basis for both: 1) self-reflection from which learning and improvements can flow and 2) group reflection and dialogue, and it is the latter that I am stressing in this note. The ultimate benefit of the tool is realized through the collective learning that takes place as a result of group dialogue and reflection, then making changes based on such learning. Such dialogue and reflection also form the basis of consensus negotiations needed for collective action.

The collective analysis, reflection and learning through dialogue initiated by the SAS survey is most advantageous when there is broad participant inclusion. That is not to say that leaders should strive for a large number of participants, but leaders should be concerned with including a representative range of perspectives that exist among partnership members. Also, it is not critical that dialogue participants possess exhaustive knowledge about the structural and procedural characteristics of the partnership. By involving diverse knowledge and perspectives, dialogue should be relatively rich and social learning should be greater.

Future Application

The U.T. Water Resource Research Center (ISSE) mentioned earlier has been designated the Center of Excellence for Watershed Management in Tennessee with the Cumberland River Compact by EPA. Only the second Center to be designated in the Southeast, the Tennessee Watershed Center of Excellence (TNWCE) will seek to provide “cost effective technical tools for scientific support, engineering support, and information technology, as well as assistance with legal issues, project management, outreach and education, and planning support” to watershed stakeholder groups and local governments (EPA). The TNWCE has expressed the desire for an instrument such as the tool created through this research, so it will also serve as a planning and evaluation tool for the Center.

Suggested Research

Practitioners have expressed frustration in the overall perception of watershed management and its realities. The watershed literature articulates the idealistic expectations often placed on these efforts by the general public and agencies. Studies that reveal how such factions view watershed partnerships could further the discussion of how to promote greater acceptance for the adaptive management that water resources necessitate. These analyses could take the form of social marketing research. To date, sustainable watershed

focused investigations in the social marketing field are limited. To address this, the following questions need to be answered: what are the behavioral barriers, and which behavior should be promoted. Then a program designed to influence the chosen behavior barriers should be created. The program should then be piloted and after broad implementation, be evaluated (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2000).

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APPENDICES

APPENDIX A. Criteria explanation

This appendix provides a brief discussion of Hedelin's criteria from her 'Criteria for the Assessment of Sustainable Water Management' (2007). See Table 1 on pg. 17 for her complete matrix.

Integration across disciplines

"The most effective watershed management fully integrates many different aspects of the watershed and its human community" (Bowker 2001, p.3).

- a) *Integration of knowledge from all relevant disciplines* refers to importance of including both ecological and social disciplines in the planning process of watershed management. Since the resource is connected to a range of societal factors, it is necessary to incorporate all appropriate fields in decision making for sustainable efforts.
- b) *Handling of different kinds of uncertainty* recognizes an institution's capacity to be resilient despite inevitable change. This criterion is drawn from an adaptive management strategy that claims, "management that builds resilience can sustain social-ecological systems in the face of surprise, unpredictability, and complexity" (ICSU 2002, p. 7).

Integration across values

"...purposive learners who are capable of rethinking their purposes and rules of operation in a way that reveals the limitations of their assumptions and theories, in turn driving the resolution of practical problems" (Tabara & Pahl-Wostl 2007, p.2).

- c) *Identification of the most relevant values in relation to the current issue* addresses the issue of ideological debate that almost always plagues such efforts. This is the strategic recognition of participant values which can lead to "rational reasoning" of values disputes, which are inherently irrational.
- d) *Rational discourse through relating identified values to alternative choices in the planning process* is a way to arrange and discuss participant priorities for process balance. Hedelin (2007, p.156) maintains that if "the defined values are treated like criteria against which choices and alternatives can be assessed" then ideological positions can be treated rationally.

Participation: Contributing to the process

"...complex issues and integrated management approaches cannot be tackled without taking into account stakeholder' information and perspectives and without their collaboration" (Pahl-Wostl et al. 2007, p.2).

- e) *Inclusion of local and contextual knowledge owned by relevant actors* ensures that the unique local ecosystem awareness of indigenous people and environmental planning professionals in similar areas are utilized.
- f) *A procedure for defining the actors that should be involved* measures an institution's ability to identify relevant participants. Participatory processes are not complete without all relevant actors, anyone who has a 'stake' in the state of the watershed or actions performed concerning the watershed, present during deliberations.

Participation: Generating commitment, legitimacy or acceptance

"Engagement is predicated on creating the necessary conditions to support a new relationship between expert and lay understandings of an issue, one that promotes learning different perspectives, views, and knowledge" (Petts 2006, p.172).

- g) *Handling of power asymmetries* explores a program's planning process for power imbalances. Power issues are largely seen as having "negative effect(s) on the possibility of conducting a democratic participatory process". Although power neutrality is not likely, Hedelin (2007, p.158) suggests that for sustainable watershed management, a program should promote such efforts through facilitation.
- h) *Procedures that ensure that ideological orientations are not suppressed* is similar to criterion *f*, which is concerned with the contribution of ideological orientations, but places emphasis on the importance of utilizing mechanisms that deter value censorship. Hedelin (2007) argues that differing values *should* exist and should be freely expressed, as the inclusion of this information is necessary to make effective decisions.
- i) *Learning* "is both a prerequisite, and a result of, a democratic process" (Hedelin 2007, p.159) because of the complexity of watershed issues, and should be central to a program's process. Therefore, an assessment tool must check for the active promotion of knowledge within an institution's process.

APPENDIX B. Assessment Survey

The survey contains 38 questions that relate to one or more of the criteria. Survey responses are in the form of the Five Point Likert Scale (Strongly disagree-Strongly agree) or list (only in Criteria I: question #3).

Definitions:

Watershed Partnership: The web of all individuals, interest groups, agencies, taking part in the actions surrounding the watershed.

Participant: Any person involved in any undertaking of the watershed partnership.

Stakeholder: Any person that is affected by the condition of the watershed or by actions taken within the watershed pertaining to its condition.

Institutional partner: Any organization, institute, foundation etc. that provides assistant to the watershed partnership in the form of legal, financial, political and/or technical support.

Criteria I: The Watershed Partnership, Its Representativeness, & Support.

1. The watershed partnership has acquired or is open to receiving federal and/or state financial and technical assistance.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

2. A thoughtful and well-articulated process was used to identify participants and stakeholders who should be involved in the watershed partnership.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

3. From the list below, please check the interests that are valued by citizens within your particular watershed.

- ☐ Conservation
- ☐ Recreation
- ☐ Aesthetics

- ☐ Water Quality
- ☐ Development
- ☐ Industry
- ☐ Private Landowners
- ☐ Municipal Service (Utilities, stormwater, infrastructure)
- ☐ Elected officials
- ☐ Business Owners
- ☐ Other _____

4. All stakeholder interests checked above are represented (a person or group that speaks for the particular interest) in watershed partnership dialogue and decisions.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

5. The watershed partnership has partnered with various institutions to obtain a sufficient level of all legal, financial, political, & technical support.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

6. Partners from various institutions maintain a sufficient level of interaction for effective communication with watershed participants.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

Criteria II: How does the partnership function: Framing, Deliberating, & Negotiating

1. Issues are framed in a manner that encourages collaborative approaches as opposed to promoting a sense of rivalry between stakeholders.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

2. Participants realize that watershed management is a long-term process characterized by on-going actions.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

3. Participants are aware of the uncertainty common in watershed management and are therefore comfortable with experimental policy i.e. learning and revising 'as you go'.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

4. Some form of facilitation is employed during deliberation and negotiation processes.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

5. Participants feel comfortable expressing their opinion during deliberation and negotiation processes.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

6. All values within the watershed are considered in the exploration of alternative choices when making important decisions.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

7. When considering actions--such as a new subdivision--that will impact the watershed, most participants respect differing values and interests and are willing to discuss the impacts of actions from multiple perspectives.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

8. Major decisions concerning important issues are made by consensus.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

Criteria III: How does the partnership function: How does the partnership gather, share, analyze and use data, information and knowledge?

1. All relevant fields of knowledge are included in data analysis and management regarding the watershed.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

2. The partnership makes good attempts to capture local context and knowledge involving the biophysical and social dynamics within the community.

Strongly Disagree
Disagree
Neutral
Agree

Strongly Agree

3. Data are analyzed, managed, and communicated in ways that inform participants about the connections and interactions across economic, social and environmental landscapes.

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

4. Citizens of the watershed can easily access data from various fields of knowledge (i.e. soil testing, mapping etc.).

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

5. Data are maintained and communicated in ways that can be easily understood by participants.

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

Criteria IV: Monitoring, learning and adapting.

1. Monitoring watershed conditions and impacts of partnership actions is a top priority for the watershed partnership.

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

2. Realistic key performance environmental indicators have been established as measures of success or failure as part of monitoring activities.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

3. Monitoring is considered and treated as a learning tool for improvement in addition to a compliance test to determine project fulfillment.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

4. Partnership participants are made aware of monitoring activities and are informed of the results on a regular basis.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

5. Relationships among watershed participants have improved as a result of working together on monitoring activities.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

6. Monitoring observations are communicated in a way that participants are able to comprehend and therefore can contribute to discussions on implications.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

7. Due to monitoring and its communication, a better understanding of the effort's course of action and watershed dynamics has become apparent to watershed participants.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

8. As a result of monitoring communication, participants are gaining a greater understanding of the inherent uncertainty of ecological systems.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

9. Because of their engagement in monitoring results, participants are better able to evaluate the partnership and its impact on watershed conditions.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

10. The partnership has re-evaluated and made changes for improvement due to the learning that has occurred through monitoring.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

11. The partnership has included a volunteer monitoring program as part of monitoring activities.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

V. Outreach

1. An outreach plan has been devised and implemented.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

2. Partnership outreach includes community education about the watershed

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

3. Outreach products include general information about watershed principles and human-environment linkages within the watershed.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

4. Outreach products have been successful in promoting awareness about watershed dynamics and about partnership activities.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

5. Youth education is incorporated in watershed partnership outreach.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

6. Interactive learning, a hands-on approach that goes beyond learning by observation (passive learning), is included in such youth education.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

7. The community is encouraged to be a part of restoration activities carried out by the partnership.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

8. The broader community has access to watershed staff/volunteers regarding questions or assistance.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

APPENDIX C. Assessment Survey Guide



The Watershed Partnership Sustainability Assessment Survey (SAS) Guide

Watershed partnerships address issues within some defined geography and are normally driven by local energies. As with any community group whose focus is to address complex ecological issues, watershed partnerships take a long time to produce lasting results. It is therefore necessary that these groups have the capability to produce sustainable efforts over time. *What does it take for this to happen—for a partnership to produce lasting effects so that it can address the myriad of systemic problems found within a watershed?*

The Watershed Partnership Sustainability Assessment Survey (SAS) and this Assessment Guide have been developed to help water-based partnerships answer this question. Together the Survey and the Guide can be viewed as a “tool lit” that a partnership can employ to more closely align its practices to sustainability principles (represented by the five criteria noted below) that will ultimately help to create lasting results overtime. Five criteria were synthesized from the literature regarding sustainable watershed partnerships to create the SAS Survey. The SAS

Survey is intended to function as a mechanism for *self*-assessing how closely a partnership’s structure and process align with sustainable principles. The identified criteria support the following common themes: sustainable partnerships have 1-well functioning social partnerships and produce good levels of social capital, and 2-also have the capacity to deal with uncertainty and change for resilience. The survey contains 38 questions that relate to one or more of the criteria. Survey responses are in the form of the Five Point Likert Scale (Strongly disagree-Strongly agree) or list (only in Criteria I: question #3).

- Criteria I: Representativeness, & Support**
- Criteria II: Framing, Deliberating, & Negotiating**
- Criteria III: Data, Information, & Knowledge Management.**
- Criteria IV: Monitoring, Learning, & Adapting**
- Criteria V: Outreach**

Since the SAS survey is a self-assessment, findings from survey application are exclusively for partnership analysis, reflection and discussion. It is recommended

that a broad and diverse group of watershed participants be encouraged to take the survey. By encouraging individuals with diverse perspectives to take that survey and join collective discussions regarding its meaning, rich analysis and results can be attained to foster a sustained future for the partnership. Naturally, participants should be selected to take the survey who have sufficient knowledge of the partnership to objectively answer the questions.

It is strongly recommended that survey participants meet to have a collective discussion about their responses to the survey and the meaning of their responses regarding partnership sustainability. It will be particularly important to discuss survey questions where at least some participants differed from sustainability principles discussed in this assessment guide. In addition, it will be important for participants to discuss items that they found meaningful in reading through the assessment guide.

The purpose of this assessment guide is twofold: 1) to help the reader better understand the benefits and relevance of the criteria used to develop the survey and 2) to foster a post-survey discussion to develop pragmatic recommendations on how a partnership can put these criteria into practice. The guide is arranged as follows: Criteria from the survey are listed first followed by the actual survey question in italics. A brief discussion concerning sustainability relevance and justification are then provided. Suggestions in the form of strategies, techniques, links and/or thought provoking questions are offered in text boxes either following question discussion or on the sides of the page.

Definitions:

Institutional partner: Any organization, institute, foundation etc. that provides assistant to the watershed partnership in the form of legal, financial, political and/or technical support.

Participant: Any person involved in any undertaking of the watershed partnership.

Resilience: The capability of a system, whether it be social or ecological, to absorb external shocks and recover or adjust.

Social Capital: The social connections or fellowship that adds substance and value to lives and productivity among communities.

Stakeholder: Any person that is affected by the condition of the watershed or by actions taken within the watershed pertaining to its condition.

Watershed Partnership: The web of all individuals, interest groups, agencies, taking part in the actions surrounding the watershed.

Criteria I: The Watershed Partnership, Its Representativeness, & Support.

1. The watershed partnership has acquired or is open to receiving federal and/or state financial and technical assistance.

An effective model for watershed partnerships found in sustainability literature is that they should be based on local leadership and ownership with strategic involvement of federal agencies. Local engagement is essential to address local biophysical and political conditions and to build local ownership and social capital. Federal partners are often essential in providing both technical and financial resources needed for local application. Also, the inclusion of structured government agencies provides a sense of stability, which enhances legitimacy.

Technical assistance, financial support and participant confidence are critical for partnership resilience.

Consider the following federal branches for potential partners. Practitioners may be surprised to learn what seemingly disconnected agencies can offer and at their willingness to support local watershed efforts.

AmeriCorps:

http://www.americorps.gov/for_organizations/overview/index.asp

Bureau of Land Management

http://www.blm.gov/wo/st/en/prog/more/partnerships_home.html

Council on Environmental Quality

<http://www.whitehouse.gov/administration/eop/ceq/initiatives/PandG>

Corps of Engineers

<http://www.usace.army.mil/CECW/Pages/partners.aspx>

Department of Agriculture

<http://www.nifa.usda.gov/fo/waterqualityicgp.cfm>

<http://www.nrcs.usda.gov/programs/WSRehab/>

Department of Health & Human Services

<http://www.hhs.gov/grants/>

Environmental Protection Agency

<http://www.epa.gov/>

Farm Service Agency

<http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=landing>

Fish and Wildlife Service

<http://www.fws.gov/partnerships/>

US Geological Survey

<http://egsc.usgs.gov/partners.html>

Southeast: Tennessee Valley Authority

http://www.tva.gov/river/landandshore/landuse_contacts.htm

*Questions
2 & 4*

(Question 3 was included to help respondents think about potential interests held by watershed community members so as to prepare them for the next question. Question 3 response has no bearing on survey scoring.)

- 2. A thoughtful and well-articulated process was used to identify participants & stakeholders who should be involved in the watershed partnership.*
- 4. All stakeholder interests checked above are represented (a person or group that speaks for the particular interest) in watershed partnership dialogue and decisions.*

In the long run, participants will have more confidence in a process that includes all interests and sufficient representation of those interests. Promoting a sense of fairness will normally result in greater long-term acceptance and trust. Additionally, the complex nature of watershed management necessitates the integration of all stakeholder perspectives. Exclusion of stakeholders and their interests can lead to information gaps and ultimately damage the integrity of agreements. The inclusion of multiple perspectives also promotes greater

Consider the following Questions:

- *If there is a process, do you think your procedure identified every person that should be involved?
 - *Do you consult with diverse community interests regarding important watershed concerns or partnership actions?
 - *Have you encountered feedback from any persons or entity revealing that they should have been involved but weren't?
- Refer to the list provided to you in question 3:**
- *Are there any interests that were not checked that should be involved?
 - *Can you think of problems-or lost opportunities- that would have made a difference in watershed planning had a certain interest been better represented?

understanding of the issues surrounding the watershed. This diversity enhances the group's capacity to deal with change and uncertainty (resilience).

For a watershed partnership to ensure comprehensive representation, a procedure that identifies all community interests is beneficial. Such a procedure is a purposive course of action to identify the range of interests held by community members and involves research regarding what's important to community members.

5. The watershed partnership has partnered with various institutions to obtain a sufficient level of legal, financial, political, & technical support.

Bridge organizations, institutional partners that assist the partnership, afford partnerships with a wide range of support required to cope with the prevailing and emerging challenges of watershed management.

Cooperation with authorities- local governance structures, water utility boards, universities, NGO's- creates action partnerships that work in concert to achieve common goals.

As connections are made, the partnership diversifies making it more able to respond to change and uncertainty.

A sufficient level of institutional integration is highly contextual. For more mature watershed associations,

Consider the following Questions:

*Do you believe you have acquired all appropriate partners?

*Has the partnership attempted to establish connections that may be beneficial to the partnership?

*Considered partnering with the following organizations:

- State agencies
- Mass media
- Area colleges or universities
- Farm association
- Conservation organizations
- Commerce organizations
- Elected officials
- Utility districts
- Regional or local watershed forums
- Local government agencies
- Teachers unions
- Women's societies
- Recreation groups
- Homeowner associations
- Religious organizations
- Environmental consulting firms

successful organizational bridging would mean that they have received the following kinds of assistance:

- Monetary assistance
- Policy advising
- Technical services
- Aid in ecological monitoring
- Political backing
- Enlistment from institutions responsible for the system degradation

Other important partners may exist depending on local issues. A bridge is advised if the potential organization's involvement would correspond with the dynamics of the watershed and the nature of its contamination. For example, stormwater discharges from utility districts may be a point source pollutant in some watersheds. In many cases facilities such as these have received violations regarding their non-compliance with discharge standards. By opening up lines of communication, watershed partnerships and utility districts can together work towards a common goal.

Note: Religious organizations are often overlooked in bridge organization consideration. Groups such as Interfaith Power and Light, <http://interfaithpowerandlight.org/>, are dedicated to raising awareness about conservation issues in religious forums. This setting may be the only opportunity to reach some people. Although many of these types of organizations are involved at a national level, local chapters may be highly involved in community conservation efforts.

6. Partners from various institutions maintain a sufficient level of interaction for effective communication with watershed participants.

Ways to Interact:

- Workshops
- Barbecues
- Field trips
- Field days
- River floats
- Trash pickup competitions
- River photography contest
- ‘Walk for watersheds’ (could even make that one a fundraiser)
- Bake sale: ‘cakes for clean water’ or something (certainly a fundraiser) etc.
- Farm tours
- Tree plantings or invasive plant removal work days

Bridge organizations not only provide practical support, but also generate trust among participants (social capital), contribute to the collective memory/experience of the group, and enhance social learning. Dialogue between the partnership and bridge organizations across different scales can create opportunities for groups, who would not normally interact, to bond and build dependable relationships. Actors within these organizations can also impart additional insight given their accumulated experience of the resource.

These additional perspectives strengthen the diversity of the group, allowing it to better respond to crisis and build its knowledge base for increased resilience.

It is important to convene and discuss the issues, but it is also important to provide opportunities for participants to interact other than in meetings. Think of ways to get partners and participants together and keep them engaged, even if it doesn't fit the particular agenda item of the moment.

Criteria II: How does the partnership function: Framing, Deliberating, & Negotiating

*Questions
1-3*

- 1. Issues are framed in a manner that encourages collaborative approaches as opposed to promoting a sense of rivalry between stakeholders.*

2. Participants realize that watershed management is a long-term process characterized by on-going actions.

3. Participants are aware of the uncertainty common in watershed management and are therefore comfortable with experimental policy i.e. learning and revising 'as you go'.

Watershed issues are dynamic and complex, and watershed participants have diverse perspectives, experiences and interests regarding the watershed. It is important that issues be framed in ways that resonate with a wide variety of participants, so they are motivated to engage in watershed activities. Leaders who help frame issues in this way help participants address the challenges inherent in watershed work. In addition,

innovative group decisions work well when participants find common ground rather than becoming pitted against each other. Collaborative approaches should be used that foster dialogue regarding diverse views and interests, and encourage brainstorming and negotiation. Such approaches help to reduce conflict and foster social learning, which in turn strengthens the group's resiliency and builds trust and needed social capital.

Moreover, the nature of the resource, and what can be expected out of the process, should strongly influence the development of participant's outlook. Participants should be informed that watershed improvement takes a long time, involves perpetual maintenance and requires monitoring, social learning and

Consider the following questions:

- *Is the focus on gaining insight about interests instead of declaring positions?
- *Do participants have clear, realistic expectations for the process?
- *Have they been encouraged to think of the watershed as a resource that needs perpetual maintenance?
- *Are they comfortable with the fact that we don't know everything about this resource, but that we must manage for what we know?

adaptation. Also, given the ambiguity of the resource, actions may be experimental. Actors will be more willing to accept setbacks and learn from them if they expect it.

Framing Techniques:

- * Set the stage by creating a challenge mindset among participants. Motivate them to want to be creative and find solutions as group.
- * Group learning exercises that focus on the linkages in the ecosystem and between cause (i.e. modifying land cover) and effect (i.e. stream bank erosion) can help participants understand the realistic nature of the process (long-term and experimental).

Partnerships would benefit from including a program that focuses specifically on framing issues with the public. It is important to build public confidence and support for actions undertaken by the partnership such as monitoring and acceptance of best available science pertaining to monitoring data. This element could be included in an outreach plan.

Questions
4-8

4. *Some form of facilitation is employed during deliberation and negotiation processes.*
5. *Participants feel comfortable expressing their opinion during deliberation and negotiation processes.*
6. *All values within the watershed are considered in the exploration of alternative choices when making important decisions.*

7. When considering actions--such as a new subdivision--that will impact the watershed, most participants respect differing values and interests and are willing to discuss the impacts of actions from multiple perspectives.

8. Major decisions concerning important decisions are made by consensus.

Quality decisions produce lasting results. Quality decisions about watershed management are reached if the social process is managed in a way that fosters reciprocal learning and informed decision making. Therefore, how partnership leaders handle social interactions during the deliberation and negotiation process helps determine the quality of decisions. Improving social interaction in the context of watershed management is often done by emphasizing 'deliberative techniques'. These deliberative techniques are methods for creating interactive platforms that generate trust and promote consensus building, all of which create a unique learning environment. Techniques (discussed below) include employing an effective facilitator and encouraging value communication.

Consider the following questions:

- *Are people encouraged to withhold judgement and consider diverse alternatives in addressing issues?
- *How do you ensure non-vocal participants are being heard?
- *Are alternatives established and discussed?
- *For the most part, are participants empathetic to interests other than their own?

Inclusion of a third party facilitator is a recommended technique for collaborative processes involving conflictual or difficult issues. Participants are more willing to accept direction from a leader that stands to gain nothing from the process. An impartial group organizer can instill confidence and more effectively guide the process from this neutral position. If conditions don't warrant a third party facilitator, or if the group cannot afford this position due to budgetary constraints, it is important that someone assumes the role of a facilitator. This allows that

person to focus her/his energies on deliberative process rather than substantive issues.

The inclusion of a conscious process that encourages value communication and mutual understanding is considered essential for consensus building. This process involves participants voicing their values and discussing them in a small group setting. This technique may require a facilitator, but can be executed by a group leader. Often referred to as Rational Discourse, this approach is a value-structuring process that reveals common interests among participants leading to 'ah-ha' moments of enlightenment. The idea is not to change stakeholders' interest, but to help them to understand and respect other stakeholder interests. This newfound awareness improves trust and increases the likelihood of abandoning entrenched position. Mutual benefit exploration can build social capital (which better equips the group to deal with future decisions), further advance group knowledge and yield enduring watershed action.

Consensus Building Techniques:

- *Openly communicate principal concerns through group discussions.
- * Take advantage of *joint-fact finding*, where the group as a whole participates in finding facts.
- *Assemble an outline of key objectives and alternatives for visual sense making.
- *Utilize brainstorming or scenario building to envision multiple actions.
- *Foster shared identities within the group and a shared responsibility mindset through group activities.
- *Construct teams (combine those who may have competing interests) and challenge each to come up with the most beneficial solution to a small issue.

Exercise 2:

A specific technique is called the ‘dialogue method’, where all parties are asked to discuss their answers to the following three questions: 1) How am I connected to this issue?
2) What are the guts-central points-of this issue?
3) What is gray or unclear to me about this issue?

Exercise 1:

One way to evaluate an effective value structuring process is to ask all active negotiating participants to list all the values involved in the watershed. Then ask them to rate them by importance. All should be able to list relevant issues and indicate that all are equally important. This is evidence of enlightenment.

Criteria III: How does the partnership function: How does the partnership gather, share, analyze and use data, information and knowledge?

*Questions
1 & 2*

- 1. All relevant fields of knowledge are included in data analysis and management regarding the watershed.*
- 2. The partnership makes good attempts to capture local context and knowledge involving the biophysical and social dynamics within the community.*

No one scientific discipline can produce sustainable solutions to the complex issues surrounding watershed management. It is the combination of all relevant knowledge fields that produces a strong foundation and allows for comprehensive watershed planning. Whole system knowledge integration requires the inclusion of a range of skills from the scientific and social science realm. In other words, water engineers who design flow schemes will most likely not perform water sample analyses and neither can they provide insight on the dynamics of private property rights.

Equally important is the inclusion of local and contextual knowledge about the resource and social behavior surrounding it. The unique awareness of local people can represent the accumulation of knowledge over generations that can be invaluable to systems planning. This insight may come from a farmer that has documented slow changes within the ecosystem over time or a builder who routinely encounters push back within the community over certain construction

activities. Expanding comprehension of complex ecosystem characteristics in this way further advances a partnership's ability to adapt to change within the process.

Relevant knowledge is highly dependent on the nature of the specific watershed dynamics and pollution sources. Adequate professional/contextual knowledge inclusion corresponds with the characteristics and issues within the watershed.

Consider the following Questions:

Are there any knowledge gaps that should be addressed?

Has the partnership incorporated local knowledge?

Has the group taken advantage of contextual knowledge from sources such as watershed professionals or local watershed studies?

Have the 'active' community members been utilized?

Consider the following specialties:

Natural Resources	Agriculture
* Water Engineering	* Resource Economics
* Forest Management	* Crop Technologies
* Wetland Ecology	* Irrigation Management
* Terrestrial Ecology	* Soil Management
* Riparian Systems	* Humanities
* Fisheries Biology	* Policy Development
* Aquaculture	* Multicultural Specialties
* Wildlife Biology	* Architecture
* Geographic Information Systems	* Planning
* Landscape Classification	* Anthropology
* Landscape Ecology	* Gender Issues
* Grazing Management	* Community Development
* Geomorphology	* Group Processing
* Soil Science	
* Water Quality	

<http://www.ecosystemsciences.com/>

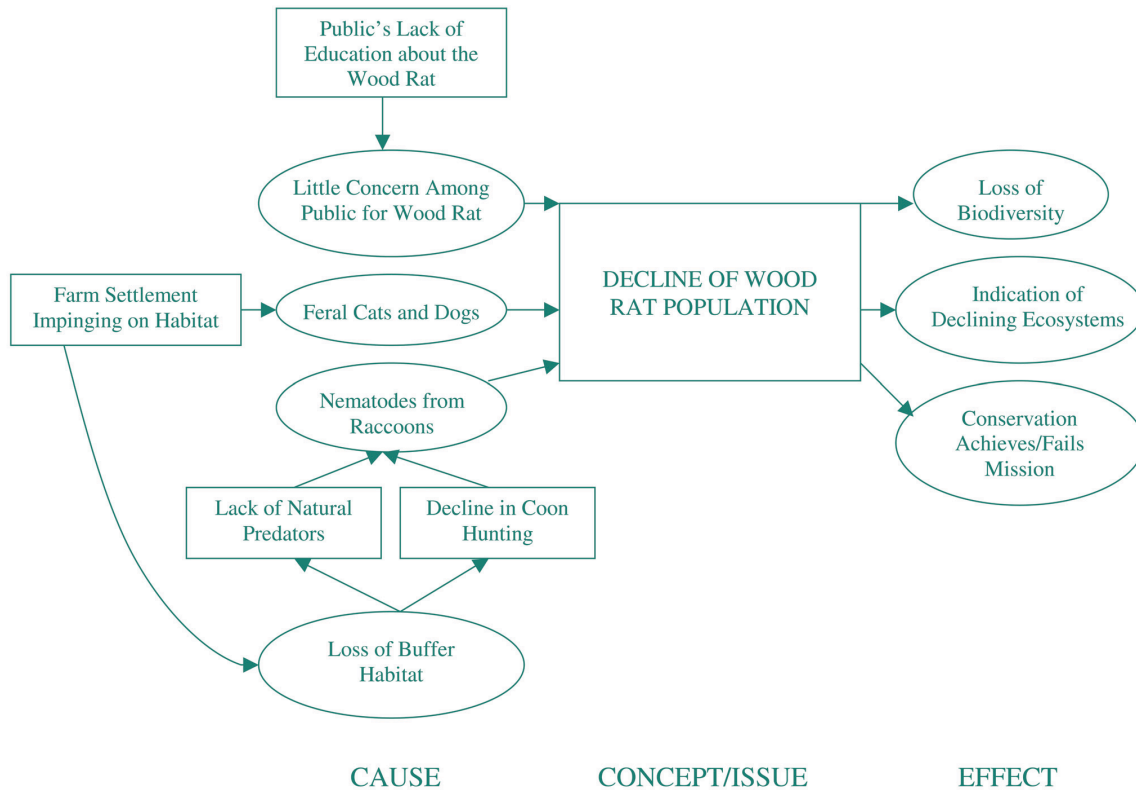
Note: Bridge partners, such as universities, will likely contribute assistance at no cost. For example, The Tennessee Water Resources Research Center is a University of Tennessee partner that assists watershed partnerships and other local stakeholder associations by providing support in form of products and services that promote education and water resource issues training.

3. Data are analyzed, managed, and communicated in ways that inform participants about the connections and interactions across economic, social and environmental landscapes.

It is important that participants are conscious of the complexity of natural systems, how they are intimately linked to social systems, and what that means to watershed management. Consider the following communication example: “excessive nutrients from field fertilization make their way into streams and cause algae to grow which removes much needed oxygen from the system, which kills species dependent on the oxygen”. Data can be communicated in ways so that participants understand connections. In this case, the communication passage explains the biophysical reaction, what caused it and a biological impact. To communicate in a more holistic fashion so that other interests are included, the economic/social connection should also be included. Given economic considerations, it will be difficult—and possibly not warranted—for policy to simply eliminate field fertilization, as the practice is considered necessary to sustain livelihoods.

To help participants better understand such interconnections, a ‘Concept Map’ is warranted which is a tool that allows participants to visualize connections in a comprehensible form. Connections can seem complicated and difficult to grasp. The concept map allows them to make sense of them by breaking them down linearly. Also, participants can create their own which reveals perceptions of causality. Below is an example of a concept map found in the EPA publication *Community Culture and the Environment: A Guide to Understanding a Sense of Place* (2002).

Figure S4-33—Concept Map



U.S. EPA: Concept Map

*Questions
4 & 5*

4. *Citizens of the watershed can easily access data from various fields of knowledge (i.e. soil testing, mapping etc.).*
5. *Data are maintained and communicated in ways that can be easily understood by participants.*

Participants need to be able to obtain and understand data pertaining to watershed dynamics and actions. This may seem obvious, but inaccessible and overly technical information are frequently cited in the watershed literature as common barriers to participation and social learning. By avoiding this process deficiency, leadership reduces mistrust, builds knowledge, increases awareness, and provides more opportunities for participants to interact.

Exercise:

‘Storm Drain Stenciling’ is an activity that can very effectively illustrate the storm drain/waterway connection.

<http://www.clark.wa.gov/water-resources/education/stenciling.html>

Further reading:

Maurel, P., H. Otter, R. Raymond, M. Craps, & C. Pahl-Wostl. **2007**. The role of IC-tools and methods in social learning processes for river basin management. *Ecology and Society*, in press.

Criteria IV: Monitoring, learning and adapting.

A precondition for a watershed partnership to produce sustainable efforts is the ability to effectively monitor for learning and improvement. A quality monitoring program will result in improved resource knowledge, a better understanding for informed decisions and an increase in the capacity of the partnership to detect and respond to change. Monitoring program designs would not be complete without involving the public. Volunteer monitoring programs build social capital and are effective in demonstrating the intrinsic uncertainty in complex systems. The latter is important in the facilitation of public acceptance of Best Available Science (See framing: p. 9).

*Questions
1&2*

- 1. Monitoring watershed conditions and impacts of partnership actions is a top priority for the watershed partnership.*
- 2. Realistic key performance environmental indicators have been established as measures of success or failure as part of monitoring activities.*

Partnerships benefit from a strong monitoring program that evaluates and re-evaluates watershed conditions so to track changes and adapt accordingly. It is particularly important to funders, such as the EPA, that partnerships assess the impacts and progression of actions. As such, the agency has offered an ecological monitoring design for partnerships to draw from:

This link will direct you to the EPA's Watershed Academy. Offered here is a development strategy that partnerships can refer to in the first stages of developing their monitoring program.

<http://www.epa.gov/watertrain/>

This link will take you to the EPA's Environmental Monitoring and Assessment Program (EMAP). This is a resource to assist partnerships in understanding what their environmental monitoring data means.

<http://www.epa.gov/emap/>

Establishing indicators that identify discrepancies between partnership targets versus what has actually been accomplished is the first step in creating an effective monitoring program. Examples of ecological indicators are provided in the EPA monitoring guide as well as in the resources below.

Other monitoring resources:

The Monterey Bay Sanctuary: Citizen Watershed Monitoring Partnership recommends their Citizen Monitoring protocol to partnerships interested in this monitoring strategy.

<http://montereybay.noaa.gov/monitoringpartnership/protocols.html>

The Oregon Watershed Enhancement Board offers many watershed partnership publications and guides. The Water quality monitoring technical guide book link is below.

[http://oregon.gov/OWEB/publications.shtml#Technical Guidance and Related Publications](http://oregon.gov/OWEB/publications.shtml#Technical_Guidance_and_Related_Publications)

3. Monitoring is considered and treated as a learning tool for improvement in addition to a compliance test to determine project fulfillment.

Partnerships that receive monetary assistance are required to monitor ecological conditions, but it is important that the practice be considered valuable and as an opportunity to advance learning through feedback and enhance collaborative conditions as opposed to simply a compliance reality.

Questions 4-11 are some indicators of successful monitoring techniques for improved collaboration and knowledge building.

4. Partnership participants are made aware of monitoring activities and are informed of the results on a regular basis.

5. Relationships among watershed participants have improved as a result of working together on monitoring activities.

6. Monitoring observations are communicated in a way that participants are able to comprehend and therefore can contribute to discussions on implications.

7. *Due to monitoring and its communication, a better understanding of the effort's course of action and watershed dynamics has become apparent to watershed participants.*
8. *As a result of monitoring communication, participants are gaining a greater appreciation of the inherent uncertainty of ecological systems.*
9. *Because of their engagement in monitoring results, participants are better able to evaluate the partnership and its impact on watershed conditions. **
10. *The partnership has re-evaluated and made changes for improvement due to the learning that has occurred through monitoring.*
11. *The partnership has included a volunteer monitoring program as part of monitoring activities.*

*Attribution: Findings from monitoring can be translated in ways so that the relationship between cause and effect resonates with participants. By stressing causality (i.e. 'the marked sediment reduction in Wright stream can be directly attributed to Mr. Wright erecting a screen so the cows cannot get to the water' or 'Mr. Wright not being included in partnership discussions resulted in his distrust of the program and would therefore not cooperate) leaders are encouraging participants to think creatively and observe program impacts. Attribution is difficult to identify. That said, participants can be informed of the 'possible' or 'likely' connections between actions and results.



Noteworthy monitoring activities:

'Water Watchers'

<http://blog.auburn.edu/aww/?p=71>

Georgia Adopt-A-Stream

http://georgiaadoptastream.com//db/aas_levels.asp

The Secchi Dip-In

<http://dipin.kent.edu/whatis.htm>

Water Action Volunteers

<http://www.uwex.edu/erc/wavdb/>

Further reading:

<http://www.usawaterquality.org/volunteer/>

<http://montereybay.noaa.gov/monitoringpartnership/protocols.html>



A Comparative Analysis of Water Quality Monitoring Programs in the Southeast: Lessons for Tennessee provides a very detailed review and comparative analysis of Alabama Water Watch, Georgia AAS and the KY AAS programs.

<http://isse.utk.edu/wrrc/pdf/mainbook.pdf>

Resource links from EPA's volunteer monitoring website:

<http://www.epa.gov/owow/monitoring/volunteer/>

Criteria V. Outreach

1. *An outreach plan has been devised and implemented.*

For a partnership to produce sustainable efforts, it must educate the general public. Not all citizens can be active participants and intimately involved in the collaborative process. It is important that these individuals are also exposed to some understanding of the ecological system and how it is altered. Often, a major source of sediment loading comes from the residential sector. Since non-point source pollution, such as this, is difficult to regulate a partnership must inform the community with the corollary knowledge of their actions. It is therefore important to create an action plan that maps out ways to reach these residents.

Developing an outreach plan: <http://www.epa.gov/watertrain/gettinginstep/>

Questions
2-4

- 2. Partnership outreach includes tools geared towards community education about the watershed*
- 3. Outreach products include general information about watershed principles and human-environment linkages within the watershed.*
- 4. Outreach products have been successful in promoting awareness about watershed dynamics and about partnership activities.*

Successful outreach plans take advantage of various tools that inform the public about general watershed dynamics and how residential practices can affect the quality of the system. It is also beneficial for a plan to specifically address the creation of the group's institutional identity so to establish a presence within the community. This may include distributing products such as hats, t-shirts, car decals, etc. that bear the partnership logo.

Outreach resources: The following links will direct you to numerous outreach materials and suggested outreach activities.

<http://cfpub.epa.gov/npdes/stormwatermonth.cfm>

<http://www.epa.gov/OWOW/watershed/outreach/outreachnonjs.html>

<http://www.lcbp.org/programs.htm>

<http://www.srrc.org/programs/watershedded.php>

Consider the following resource that serves as an evaluation of outreach products.

The Center for Watershed Protection has a vast collection of partnership resources, but the *Monitoring to Demonstrate Environmental Results* manual is the resource provided for evaluating outreach products. The link is listed below. This manual can be found in the 'Other Manuals' section.

<http://www.cwp.org/Forms/accessform.htm>

*Questions
5&6*

5. *Youth education is incorporated in watershed partnership outreach.*

6. *Interactive learning, a hands-on approach that goes beyond learning by observation (passive learning), is included in such youth education.*

Watershed partnerships seeking lasting results would benefit by incorporating a robust youth education component to their outreach plan. Efforts become truly sustainable when future leaders are inspired and become champions of a cause. Encouraging youth to consider responsible land use increases the likelihood that future generations will make environmentally and economically sound decisions concerning the watershed. Interactive learning, a hands-on approach, is viewed as a highly effective technique for informing youth. Interactive learning may come in the form of building outdoor classrooms or web-based resources that prompt exploration.

Service Learning

David Sobel's *Place-Based Education: Connecting Classrooms & Communities* is an education resource that focuses on service learning, a hands on approach that involves students actively solving community problems while participating meaningful civic engagement.

<http://www.ecoliteracy.org/strategies/place-based-learning>

The National community service website is also concerned with service learning. The service's program Learn and Serve America provides communities with service learning assistance through grants, training, and research.

<http://www.learnandserve.gov/>



Noteworthy Youth Education:

How to build an outdoor classroom

[Outdoorclassroom.pdf](#)

Watershed education with interactive calculators and maps

<http://www.interwet.psu.edu/index.htm>

EPA: Educational techniques for all ages

<http://www.epa.gov/water/kids/watered2.html>



Questions 7&8

7. *The community is encouraged to be a part of restoration activities carried out by the partnership.*

8. *The broader community has access to watershed staff/volunteers regarding questions or assistance.*

Providing opportunities for the community to interact in a watershed project setting fosters institutional identity, resource understanding, and social capital.

Often, partnerships do not place enough emphasis on such opportunities, taking for granted the benefits that result in regular community engagement. By encouraging them to participate in activities related to watershed restoration, residents may develop a shared sense of responsibility and become more aware of watershed characteristics and gain support for the partnership. Through community interactions, such as watershed restoration activities, partnerships can enhance social learning, which increases the community's capacity to deal with problems that arise in the future. It is also important that community residents are easily able to contact partnership leaders about restoration activities or any other watershed related inquiry. Accessibility is often cited as a barrier to participation.

Consider the following Questions:

- *Are leaders confident in their outreach strategy?
- *Is the outreach plan comprehensive in terms of reaching all age groups?
- *Are watershed fact sheets widely distributed?
- *Have leaders utilized any form of media to raise awareness?
- *Has the partnership involved local schools in any fashion?
- *Do residents ever contact staff?

Consider employing a Social Marketing Campaign:

Social marketing is a marketing application that is concerned with changing societal conduct through specific techniques, such as 'popularizing' certain behavior via commercial marketing technologies. Many social marketing campaigns have proven to be very successful in driving social change. The following resources are useful to partnerships interested in initiating a social marketing campaign.

Fostering Sustainable Behavior by McKenzie-Mohr and Smith presents "a process, community-based social marketing that attempts to make psychological knowledge relevant and accessible to... those who design environmental programs" (McKenzie-Mohr 2000).

Social Marketing Campaign continued

A brief look at this work can be accessed via the following link:

<http://www.rug.nl/psy/onderwijs/firststep/content/papers/2.3.pdf>

Hands on Social marketing: A Step-by-Step Guide by Nedra Weinreich is a guide that focuses on providing social marketing techniques to professionals that face challenges, such as budgetary constraints.

For more information follow the link below.

<http://www.social-marketing.com/book.html>

Jack Wilbur, Jan Tyler, and Kari Cutler are social marketing consultants. They provide social marketing resources that can be utilized from the link below.

<http://www.socialmarketingconsultants.com/resources.htm>

Vita

Jennifer Parris Joice was born in Knoxville, TN, on November 18, 1976 to the parents of Lee and Linda Parris. She is one of two children. She attended West Hills Elementary and continued to Bearden Middle and then Bearden High School in Knoxville, Tennessee. After discovering her passion for wildlife conservation, she entered the Wildlife and Fisheries Program at the University of Tennessee. She obtained a Bachelors of Science degree from UT in December 2001 in Wildlife and Fisheries Science. Her desire to play a role in influencing local environmental policy prompted her to continue her education with a Masters of Science with the Forestry Department under the concentration of Natural Resource Policy at the University of Tennessee. She hopes to be a part of the effort to influence local natural resource policy on a professional level in the future.