

Evaluating The Effectiveness of Local Watershed Organizations

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Evaluating The Effectiveness of Local Watershed Organizations

Abstract

The objective of this research was to examine the factors which influence the effectiveness of watershed organizations in West Virginia. Specific factors of interest included: (1) the degree of inclusiveness within these organizations; and (2) state programs to facilitate the formation of watershed organizations and to provide grants for watershed projects. Our measures of inclusiveness indicated that a higher level of inclusiveness led to greater organizational effectiveness in terms of financial resources acquired and watershed activities. The number of partners had a statistically significant, positive impact on explaining the number of distinct watershed activities undertaken by an organization. Organizations with more partners acquired a greater level of financial resources. This research makes a compelling case for state level assistance for watershed organizations. Organizations facilitated by the state had more members, were able to acquire more financial resources outside the community, and undertook a statistically greater number of watershed activities. Small grants of up to \$5,000 provide a relatively inexpensive (about \$100,000 in grants annually plus administrative costs) means to ensure survival and rapid maturity of watershed organizations. These grants have been very successful in promoting watershed organizational survival. Based upon this research, recommended state strategies include: (1) cost sharing grants which require partnerships among watershed stakeholders as evaluation criteria in grant proposals; and (2) facilitation assistance which focuses on watersheds where there exist chronic, non-crisis problems (such as generalized non-point pollution).

Introduction

West Virginia is blessed with a vast network of watersheds that historically have nurtured both the economic and social vitality of the state. However, a history of unrestricted economic development has left West Virginian watersheds with a legacy of environmental degradation. There is a recognition that the unintended cumulative impact of population and economic growth on watersheds (affecting water quality, fisheries, soil loss, and agricultural productivity) may be the single most limiting factor to the economic health and well-being in the next century (Myers 1993). Past efforts to improve water quality have focused largely on point sources of pollution. However, a regulatory shift from point to non-point sources of water quality degradation has been taking place in order to improve the 40% of the nation's surface waters which remain unsuitable for fishing and swimming (Richman 1997). At the federal level, the Environmental Protection Agency has launched cleanup strategies that address non-point source pollution prevention through a watershed approach. One element of EPA's watershed approach is the formation of local watershed partnerships.

One response to this emphasis on watershed management and partnerships has been the development of local watershed organizations. Watershed organizations have developed locally to address concerns about the surface water resource and its use. These organizations typically are involved in watershed level planning, education, and/or action projects to improve watershed quality in their community. Nationally, it has been estimated that about 1,000 watershed organizations exist (Richman 1997). Anecdotal evidence from descriptive case studies suggests that watershed restoration is possible through the collective action of diverse watershed stakeholders (Brown 1994; Maughan

1994). Numerous case study descriptions of watershed organizations are available from the literature or on the Internet (see Appendix A for a listing of these descriptions). Evidence from these case studies shows that citizens and government agencies are beginning to recognize the importance of working together, as a community, to successfully resolve the ecological problems of the watershed and to work towards a sustainable future.

Watersheds can be defined geographically as land areas that deliver the water, sediment, and dissolved substances via small streams to a major stream or river (Miller 1996). However, it is those individuals and groups that have a personal or professional stake in the watershed that form the potential community from which watershed organizations arise. Therefore, this research delineates community at the watershed level. A watershed organization is defined as an organization where: (1) at least one organizing meeting has been held; (2) organizational membership is voluntary; and (3) at least one of the organizational missions is focused on water issues in a specific geographic area which has been defined by its members.

State governments can play pivotal roles in providing assistance to watershed organizations. Many states have implemented statewide watershed management frameworks (Clements et al. 1996). For example, the states of Oregon and Washington have encouraged the formation of cooperative partnerships at the watershed level by enacting legislation and providing funding (Horton et al. 1996; Pinkerton 1991). In Kentucky, the Division of Water and the Kentucky Waterways Alliance provide grants and training programs for watershed organizations. The Ohio EPA's Division of Water has published a manual to encourage the formation of local watershed organizations which are inclusive of all stakeholders. The development of watershed plans by these organizations also is encouraged.

Watershed organizations are an emerging phenomenon in West Virginia primarily because of initiatives taken by state government. The West Virginia Division of Environmental

Protection has been active in promoting the formation and continuance of watershed organizations around the state. In 1994, the West Virginia Watershed Assessment Program (WVWAP) began a unique program to assist environmental stewardship at the local level. This program played an active role in "birthing and growing" watershed organizations around the state. The WVWAP provided a facilitator and organizational assistance (mailing, meeting scheduling, etc.) for these organizations to begin. The ultimate goal of this program was to create sustainable watershed organizations that are inclusive of the interested parties in a watershed and would seek to build community consensus by engaging in collaborative planning among these parties. A complete description of the background for the WVWAP is provided in the next section.

The existence of the WVWAP has resulted in the development of two additional institutions designed to assist watershed organizations. First, the state legislature enacted, by a unanimous vote, the West Virginia Stream Partners Act of 1996. This act provides up to twenty, \$5,000 grants to watershed organizations annually. The goal of the Stream Partners program is to assist in the formation of local partnerships for the completion of watershed improvement projects that have long-term effects on the community and the watershed. These competitive grants require a 20% match of local resources. Second, the WVWAP's role of organizational assistance to watershed organizations has been largely inherited by the Canaan Valley Institute, a non-profit organization which has used grant funding from the federal government to hire a circuit rider for watershed organizations around West Virginia.

The growth and development of watershed organizations along with state government support programs like WVWAP and Stream Partners creates a need to measure and evaluate their effectiveness. Unfortunately, many watershed organizations lack any systematic approach to evaluating whether watershed needs are being met. A lack of human and financial resources often constrains efforts to develop

effectiveness monitoring programs. Watershed organizations and supporting government agencies are sometimes guilty of using surrogate measures of effectiveness, such as whether a final report was submitted, to justify the expenditure of scarce resources and ensure agency survival. This research addresses an evaluation need by developing a systematic approach to measuring the effectiveness of watershed organizations in West Virginia and the state policies which provide support to these organizations.

The objective of this research is to examine the factors that influence the effectiveness of watershed organizations in West Virginia. Specific factors of interest include the degree of inclusiveness of these organizations, whether or not a watershed organization was formed with facilitation assistance from the WVVAP, and whether or not a watershed organization received a Stream Partners grant. This research provides an evaluation of both watershed organizations and the state government support programs.

Research questions derived from this objective include: 1) Does the formation of an organization which is inclusive of watershed stakeholders (called a watershed association) enhance the effectiveness of watershed organizations? 2) Has the WVVAP enhanced inclusiveness of watershed organizations in West Virginia? and 3) Have the WVVAP and Stream Partners program enhanced the effectiveness of watershed organizations in West Virginia?

In this research, inclusiveness was indicated by the number and type of organizational part-

ners¹. As explained further in the methods section, our attempts to measure inclusiveness by an assessment of the number of stakeholders involved in the organization proved to require too much researcher judgement about who should belong to inclusive groups. Effectiveness was examined from the outcomes that were related to a watershed organization.

Effectiveness was measured by an organization's ability to secure financial resources and undertake activities to solve watershed problems. This effectiveness measure does not evaluate what may be the ultimate goal of watershed organizations—improvements in water quality or water resource access. However, our effectiveness measure does provide what we believe are adequate indicators of organizational success in acquiring and implementing the means with which to achieve these goals.

A priori, the inclusiveness impact can be postulated either way: inclusive watershed associations may attract a greater number of partners, thereby having access to a wider range of potential resources that can be contributed to the organization. Conversely, watershed organizations that serve limited interests (i.e. advocacy groups for some aspect of watershed use) may have a stronger common bond of interest among their members, which could lead to an enhanced ability to generate resources within their communities. Thus, we hypothesize differences in watershed organizations based upon the degree of inclusiveness but not the direction of these differences.

West Virginia Watershed Assessment Program (WVWAP)

Initially established in 1993, the WVWAP was developed to address interagency concerns about the ability of any one government agency to protect water quality in the state (Constantz 1994). The first step in this program was to develop a comprehensive state-wide plan (Constantz et al. 1994). An interagency task force obtained input from 90 state-wide stakeholder groups representing the complete spectrum of political interests. This planning process exposed individuals and organizations around the state to thinking about water quality on a watershed basis. At the end of the planning process, 88% of responding stakeholder representatives found the statewide plan to be generally acceptable.

From this plan, two strategies were elevated for implementation: (1) using geographical information systems, assess the ecological health of West Virginia's watersheds; and (2) assist local people in restoring their streams through the work of watershed associations. The practical reasons for assigning high priority to watershed associations included: 1) recognizing that some local people know more about their local streams than government regulators; 2) a dwindling state government budget combined with expectations of improved water quality could be reconciled only through the creation of partnerships between state and local interests; and 3) realizing that collaborative efforts might yield better, more widely accepted solutions than conventional top-down management.

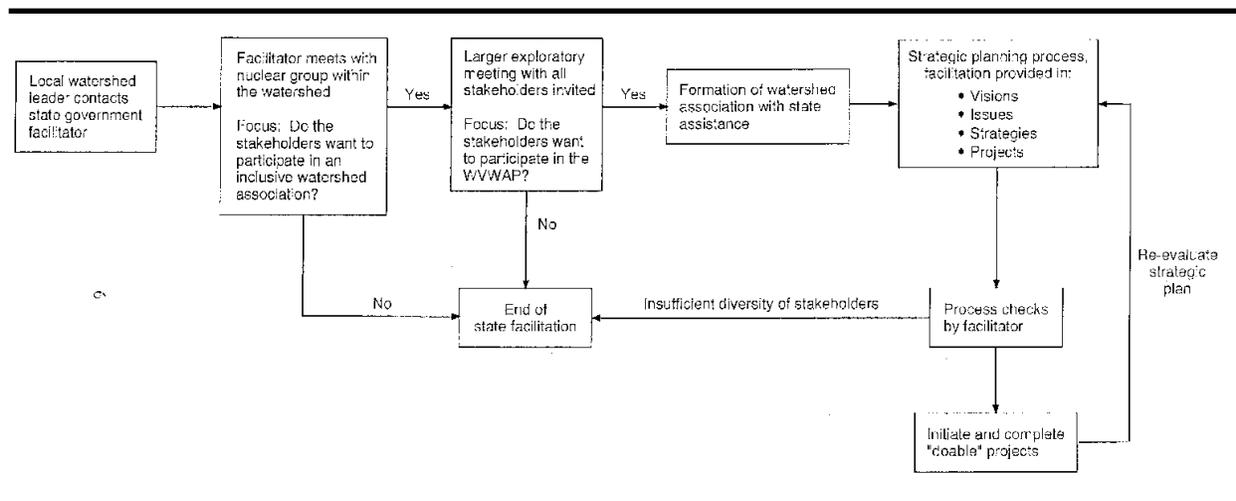
In 1994, the WVWAP began to facilitate the birth and growth of local watershed associations. Figure 1 summarizes the following description of this facilitation process. Initially, someone or an organization contacted the program director expressing an interest in developing a watershed association. This invitation indicated some local leadership and avoided the impression of "big government" intrusiveness. Public knowledge about the existence of the WVWAP was created through the media, pub-

lic presentations, and the initial statewide planning process.

Nuclear groups were typically four to six people in size. The focus of these meetings was: Do the people of this watershed want to participate in an inclusive, consensus-building watershed association? If there was an expression of interest, then a larger exploratory meeting was held where the nuclear group members invited all major stakeholders which use the river resource or whose activities may impact water quality. These exploratory meetings averaged about ten people in attendance with a range from three to twenty. At this exploratory meeting, the program director gave a presentation on the WVWAP where facilitation services were outlined and some preliminary discussion of water issues was encouraged. Again, the program director left attendees with a question: Do the people of this watershed want to participate in the WVWAP by forming a watershed association?

A positive response to the above question started WVWAP facilitation to develop a watershed association. Watershed associations formed under WVWAP facilitation were encouraged to practice transactional planning by employing: inclusiveness of stakeholders, conflict resolution among parties involved with water issues, and consensus building. These principles were followed to enhance the credibility of an association to address water issues and to maximize acceptance of strategies developed by association. In order to solve problems associated with surface water and watersheds, all of the watershed's stakeholders should be represented during the planning process. Given past experiences among stakeholders, however, they often needed the assistance of an independent facilitator to grapple with the principles of inclusiveness and consensus building. To encourage inclusiveness, all stakeholders were: invited to attend meetings, sent minutes from meetings, and provided opportunities to comment on plans drafted by the association. These practices allowed for a continuous flow of infor-

Figure 1. State Facilitation of Watershed Associations under the WVVWAP.



mation between watershed associations and those parties affected by their plans.

Once association officers and a board of directors were selected, the facilitation typically involved leading the association through a strategic planning process conducted over a series of meetings where all the stakeholders identified earlier were invited to participate. This process includes the following steps:

- * In a brainstorming session, attendees are invited to provide a vision for the watershed 50 years into the future. A group consensus is developed for this vision.
- * A creative thinking exercise is conducted where problems and opportunities associated with the river and its watershed are listed.
- * These problems and opportunities are consolidated into a manageable list of issues. The group then reaches a consensus on the top priority issue.
- * Another creative thinking exercise is conducted to solicit strategies to deal with these issues.
- * These strategies are consolidated and prioritized.
- * The single most important strategy is identified and agreed upon by consensus.

Consensus may be pure (zero dissent) or simply a substantial majority (i.e. at least 75-80% agreement).

- * The identified strategy may be large (e.g. construct a sewage treatment plant) so that the program director focuses the association on breaking up a large strategy into "bite-size" projects which incrementally contribute to accomplishing the larger strategy. These small projects are prioritized and one doable project is then implemented. Initial success, regardless of size, is crucial for community visibility of the association.
- * After the initial project is completed, the entire strategic planning process is repeated to assess changing perspectives and priorities.

Depending upon the degree of local leadership available, the program director may or may not conduct the meetings during the strategic planning process, although he attended most meetings. This strategic planning process emphasized that: (1) diverse interests are represented; (2) strategies are identified by consensus and action taken; and (3) the organization continues to exist after developing a watershed plan.

Watershed Organizations and Collective Action Theory

Collective action theory can be utilized to examine watershed organizations and their effectiveness. The literature on collective action is extensive. Traditional research of group organization has focused on groups made up of individuals with rather narrow yet strong common interests (Olson 1971; Ostrom 1990). These interests are primarily economic or social—examples include groundwater users, grazing land users, political party members, farmers, etc. A group of individuals will undertake collective action if the benefits of cooperation outweigh the costs to the individuals involved. However, as Olson (1971) notes, individuals have difficulty acting collectively as a group when the opportunity to free ride is available. The problem for a watershed organization is that provision of a public good (such as improved watershed quality) from collective action means that non-contributors often cannot be easily excluded from the benefits. The incentive for individual community members is then to free ride on the actions of watershed organizations.

Watershed organizations can select what public good and over how wide an area to provide this public good. This selection process provides some measure of control over who receives the benefits. There are trade-offs involved, however. A small area may imply a smaller population to draw from and most likely less resources, while a larger area may mean a greater population and more resources. Larger watershed areas may be potentially less effective in collective action because it is easier for individuals to benefit by free riding and to avoid any social pressures of non-contribution.

What are the benefits to be gained from collective action of a watershed organization? The collective gains must occur within the current social framework of government command and control for water quality regulation and watersheds. In West Virginia, this framework includes: most counties having no zoning and little planning, some federal mandated planning for flood insurance, and fiscal constraints of government agencies to deal with water quality

protection and in allocation of limited resources. Possible collective gains occur because: 1) watershed organizations provide an institution which enhances the coordination of public and private actions impacting watersheds; 2) being formed locally, watershed organizations may be able to better promote public education and awareness of watershed issues; and 3) watershed organizations serve as a mechanism for local citizen input into watershed management issues. Local citizens often have the more knowledge about their watershed environment and a greater incentive to protect the watershed than professional resource managers.

One potentially unique aspect of watershed associations and the WVWAP is the degree of inclusiveness with which these organizations seek to undertake collective action. Inclusiveness refers to involvement of many different groups and individuals within the community whose motivations and interests in the watershed can be very different, for example landowners versus water recreationists. Heckathorn (1993) has developed a theory on group formation which examined the degree of heterogeneity among group members in regards to resources available for contribution, the level of contribution, and benefits from public good provision. Heckathorn concluded that heterogeneity within voluntary group members in resources and benefits from public good provision enhances collective action when the action's success is most problematic, i.e. temptation to free ride is great or benefits of contributing are uncertain. Under such situations, "increases in heterogeneity foster the initial growth and expansion of social movements" (Heckathorn 1993, p.347). This is similar to the problems faced by watershed organizations.

There are two potential advantages that inclusive watershed associations create for local communities. First, the competitive position for acquiring resources outside the community (federal, state, and private sources of financial and technical resources) can be enhanced by having an active and inclusive watershed association. These resources, particularly government, are becoming increasingly scarce and rural commu-

nities must compete for them. For some watershed problems, the resources required to solve problems are so large (e.g. acid mine drainage (AMD) from abandoned coal mines) that rural communities are unable to generate sufficient local resources to solve the problem. Thus, these communities need outside resources to address the problem. Some government programs require partnerships in order to receive funding, such as the Appalachian Clean Streams Initiative established by Office of Surface Mining in 1994 to clean up AMD, which requires coordination of public and private resources along with local participation. In addition, watershed associations can attract the attention and technical resources from state and federal agencies by creating a wide base of local support for these services.

Secondly, a watershed association can serve as a positive outlet for dissatisfaction with the status quo of the watershed. Dissatisfaction comes from many different watershed users—such as recreationists and environmental groups. Water users are dissatisfied with lack of enforcement of existing federal and state regulations and the inability to control non-point pollution under current regulations; industry is dissatisfied at the lack of recognition for the efforts which have been made to prevent water pollution from point sources; and landowners are concerned with increasing regulations on land uses. Inclusive watershed associations are one way to express these dissatisfactions, educate other members of the community about these concerns, and to jointly take some positive action towards solving watershed problems.

Monitoring the Effectiveness of Local Watershed Organizations

Monitoring the effectiveness of watershed organizations is important from a number of different perspectives. Internally, careful evaluation of whether or to what extent the initiative is achieving desired outcomes will promote continuous learning and feedback. This, in turn, allows initiative members to adapt mission, goals, and actions to exploit emerging opportu-

nities. Externally, effectiveness monitoring provides supporting agencies with a measure of accountability for the scarce resources provided to the initiative. A careful balance of these two perspectives is perhaps the optimal approach to helping collaborative initiatives to succeed (NCRCRD 1997).

There are two main approaches to assessing organizational effectiveness. The first approach is called natural systems and takes the view of organizations as collective entities that engage in activities required to maintain themselves as a social unit. This approach emphasizes internal organizational processes that evoke participants' time, energy, and skills so that effectiveness is gauged by asking members how effective their organization is (Mesch and Schwirian 1996). Mesch and Schwirian (1996) utilized organizational leaders' assessments of both process and outcome effectiveness for neighborhood associations. Zander (1994) provides a list the social circumstances which he contends must exist before group organizers will be successful in group formation and presents attributes of an effective group. The second approach is called rational system, where measures of effectiveness are derived from specific goals of the organization in order to form the basis for generating effectiveness criteria (Scott 1992).

Many effectiveness measures for watershed organizations are grounded in the rational system approach. Actual water quality improvement is the long range objective of many watershed organizations. Thus, watershed monitoring programs should evaluate physical, chemical, and biological changes in the watershed so that the overall health of the watershed can be documented. This is implemented through both baseline monitoring that documents the existing condition of water resources and effectiveness monitoring that documents overall environmental improvements and monitors long-term maintenance of the improved watershed (Alexander 1993).

However, actual water quality improvement may take years to accomplish. Watershed organization members and supporting agencies need continuous feedback. Other indicators of effec-

tiveness can be used to document interim progress. These include measures of whether or to what extent important program and activity goals are being met. For example, program goals might be measured by documenting periodic written reports, the number of public meetings held, the amount of resources acquired by the association, or documented shifts in time or resources of key agencies or stakeholders. Activity goals can be measured by the number of sponsored events within the watershed or by data on the number of educational presentations given, septic tank installations inspected, or acid mine drainage remediation projects evaluated. These interim indicators will be used in this research to document effectiveness.

A team approach is often recommended as the optimal method to implement a monitoring program (NCRCD 1997). Sponsoring agencies look for objective criteria to assess effectiveness to offset the natural bias that often results from self reporting. Contrarily, the active participation of the watershed association in selecting and measuring effectiveness indicators is needed to ensure that monitoring programs are designed to help the association learn and succeed. Participant accounts should be an important component of any effectiveness monitoring program. Monitoring programs should be designed to allow continuous feedback to all stakeholders on whether important biological, physical, program, and activity goals are being accomplished.

Research Methods

The survey population for this research was derived primarily from information obtained from applications to and grants from the Stream Partners grant program. During the summer of 1996, a mail survey was conducted to profile and to assess the needs of watershed organizations in West Virginia. A sample population of 67 river, community, watershed, and related environmental organizations was developed. The mail survey instrument included questions about the size of the organization,

group representatives within the organization, watershed problems, and an open ended question about group activities and educational programs. A total of 40 responses was obtained from this survey.

Based on the results from this mail survey, a list of contact persons was developed for those organizations which were identified as possible watershed organizations. These persons were contacted for a more in-depth personal interview about the organization and its history. This interview included questions about: the watershed area of interest for the organization, members and partners involved in the watershed organization, watershed related activities undertaken, financial and in-kind resources acquired by the organization, and leader opinions and demographics.

Interviews were arranged by mail and/or telephone contact. Interviews were conducted by all three authors and two graduate students. Most interviews were conducted in person, although circumstances resulted in some interviews being conducted by telephone. Many interviews were conducted during a lunch or dinner meeting with the watershed contact person. Buying the contact person lunch or dinner proved to be an effective means of convincing individuals (most of whom serve as volunteers in their watershed organization) to subject themselves to a one and a half to two hour interview.

The important variables derived from this survey are described below along with the judgements required to create them:

- * **WVWAP:** This variable was coded one (yes) if the WVWAP director took an active role in the formation of the group. An active role was defined as attending and facilitating meetings either during group formation or to enhance the inclusiveness of an existing watershed organization.
- * **STREAM:** This variable was whether or not the watershed organization received a Stream Partners grant (yes=1, no=0).

* **PARTNERS:** The number of partners in the watershed organization were counted as organizations who either contributed financial or in-kind resources to assist the activities of the watershed organization, or were actively involved in the group's decision making through representatives. Those outside organizations that merely sent representatives to a few meetings were not counted as partners. Nor were employers of watershed organization members counted as partners when these employers did not contribute to the activities of the group. Partners were categorized into: government (local, state, and federal); business & industry; environmental groups; landowners²; recreation groups; and other non-profit organizations.

* **INCLUSIVE:** A number of one to four was used to represent organizational partners representing four categories: non-profit organizations, landowners, government, and business and industry.

* **ACTIVITIES:** The number of distinct, watershed related activities were counted during the entire life of the organization. The same activity conducted more than once was counted as only one distinct activity. For example, an organization which conducted three stream litter cleanups was considered to have conducted only one distinct activity. Examples of distinct activities included stream litter cleanups, educational programs, fish stocking, creating recreational access, stream monitoring, riparian habitat improvement, and lobbying for water quality enforcement or government agency expenditures.

* **RESOURCES:** This variable included financial resources acquired by the watershed organization over its existence either: (a) directly by the watershed organization through grants, fund raising, donations, etc.; or (b) indirectly through government projects conducted on the watershed that were the result of watershed organization

activities. This variable was adjusted for watershed population size and age of the watershed organization.

Distinct activities were categorized into size based on "rough estimates" of the financial and in-kind resources devoted to these activities. The five categories were: 1) under \$1000; 2) between \$1,000 and \$5,000; 3) between \$5,000 and \$20,000; 4) between \$20,000 and \$100,000, and 5) over \$100,000. These categories were created rather than dollar value estimates because there existed too much variation in the information obtained from contact persons about the resources utilized for activities, particularly in-kind resources. Examples of activities by category are shown in Table 1.

Inclusiveness was measured by the PARTNERS and INCLUSIVE variables. Initially, we attempted to measure inclusiveness as a ratio of the number of stakeholder groups represented within a watershed organization divided by the number of stakeholders who potentially should be involved in the watershed organization given the watershed problems cited by watershed contact persons. This measure proved to be too cumbersome as the universe of stakeholder groups became large. Also, it was difficult to assess whether some stakeholders, which we as researchers thought should be involved in the watershed organization, were adequately represented in smaller communities, e.g. environmental groups.

In addition to the survey interviews, population data were collected from Bureau of Census data. Populations of the watershed areas were estimated by relating area descriptions of the contact person to census information on community and district level populations. These population estimates were used to compute per capita membership, active participants, and acquisition of financial resources.

The initial analysis of the data included four types of comparisons between watershed organizations to examine inclusiveness and state policy impacts. These comparisons were:

1. Inclusive vs. less-inclusive watershed organizations;

Table 1. Examples of Watershed Organization Activities by Size Category.

UNDER \$1,000	BETWEEN \$1,000 AND \$5,000	BETWEEN \$5,000 AND \$20,000	BETWEEN \$20,000 AND \$100,000	OVER \$100,000
<ul style="list-style-type: none"> • One litter cleanup • Conducting a public forum with educational displays • Maintenance performed on flooding warning gauges • One fish stocking 	<ul style="list-style-type: none"> • Fish stocking for 3 years • Multiple (2-4) litter cleanups • Assistance to begin other watershed organizations • Litter cleanup and tree planting • Publication of a watershed history book • Educational program for schools 	<ul style="list-style-type: none"> • Stream bank restoration project (2 miles) • Survey of recreational needs • Establishment of recreational access 	<ul style="list-style-type: none"> • Baseline river study • Stream water quality assessment • Stream & fish habitat restoration 	<ul style="list-style-type: none"> • Treatment of acid drainage from abandoned coal mines • Stream bank strengthening for flood protection and cleanup of flooding debris • Hosting an annual river festival for public education • Construction of a fishing pier • Environmental and social impact study for construction of a flood control dam

2. WWAP facilitated vs. non-facilitated watershed organizations;
3. Stream Partner recipients vs. non recipients; and
4. Grassroot watershed organizations vs. non-grassroot organizations.

The distinction between inclusive and less inclusive was made on the basis of median number of partners. Those watershed organizations with more than the median (>10) were categorized as inclusive and those with less than or equal to 10 were put in the less inclusive category. All organizations (active and non-active) were included in this comparison.

The comparison between WWAP facilitated watershed organizations and those that were not facilitated was based upon active organizations at the time of the interview. Only active

organizations were utilized in this comparison in order to make the two categories more comparable. Because this facilitation was largely a past event (all facilitation under the WWAP was conducted between 1994 to 1996), a limited amount of information exists about those watershed organizations which were not facilitated by the WWAP, yet attempted to become active between 1994 and 1996, but are not currently active. Thus, we utilized only currently active organizations to more accurately evaluate WWAP facilitation. All organizations (active and non-active) were included in the comparison of the Stream Partner grant recipients because this is a current event and, in some cases, inactive groups continue to pursue these grants to act as the catalyst to undertake activities.

A final comparison was made between what are termed grassroot watershed organizations

versus non-grassroot organizations. Grassroot watershed organizations were defined as those organizations that began within the community at large and have watershed issues as their sole mission. These organizations were expected to be more inclusive than non-grassroot. Non-grassroot organizations were those that embraced watershed issues as part of a larger organizational mission (e.g. community development organizations) and/or were formed by a limited number of individuals in the community. All organizations (active and non-active) were included in this comparison.

Variable means, medians and distributions were compared for organizational membership, partners, resources acquired, activities undertaken, and leadership opinions. Financial resources acquired from both outside and within the watershed community were examined. T-tests for differences in variable means were conducted. However, medians were frequently relied upon in making observations about the above comparisons, as the sample sizes were small and a wide variation in the data often existed.

In the second analysis, ordinary least square (OLS) regressions were used to explain the dependent variables of RESOURCES and ACTIVITIES. Independent variables utilized in the regression models were measures of state policy and inclusiveness. These variables included: PARTNERS, WWAP, and STREAM. Pearson correlation coefficients between the dependent variables and numerous variables describing organizational, watershed, and leadership characteristics were examined to determine other potentially relevant relationships. The only additional independent variables that were added to the model included: watershed population, the size of the organization, the watershed problem, and leadership opinion on inclusiveness. Stepwise regression was used to determine final models.

Survey and Analysis Results

Leaders of 52 organizations were contacted either by telephone (when phone numbers were available) or by mail to request interviews. Of

these organizations, 32 interviews were completed, there were eleven no responses or interview refusals, and nine leaders were contacted yet not interviewed due to their organizations not being watershed organizations. A listing of watershed organizations interviewed is provided in Table 2.

West Virginia was divided up into four regions to categorize watershed organizations interviewed: 1) North Central; 2) Ohio River; 3) Southern; and 4) Eastern Panhandle (Figure 2). The highest concentrations of organizations are in the North Central and Eastern Panhandle regions of the state. Non-point pollution is a common concern of watershed organizations within all regions (Table 3). Other watershed concerns of note included: a) acid mine drainage (AMD) from abandoned coal mines in the North Central; b) flooding in the North Central and Eastern Panhandle; and c) access to river use activities in the Southern.

Brief organizational history and activity descriptions are provided in Appendix C for each watershed organization, by region, which was interviewed for this research. As a summary of what West Virginia watershed organizations look like, Table 4 and the following material provide descriptive information about a typical watershed organization in West Virginia based upon means and medians of the organizations surveyed.

The typical watershed organization is a recent phenomena with a formation date of spring 1995. Common missions of this organization were to clean up and improve water quality; to promote tourism and/or river recreation activities; and to formulate a watershed management plan. Watershed organizations typically had about 10 partners which included local, state and federal government agencies; business & industry; an environmental group; and another non-profit organization in the community. Recreation groups and landowners were represented in less than half of the watershed organizations. The typical watershed organization was found to be inclusive by our measure, with 80.8% (21 of the 26 active groups) having representation from three or more of the four

Table 2. West Virginia Watershed Organizations Whose Leaders were Interviewed.

ORGANIZATION NAME	FORMATION DATE (Month/year)	ACTIVE GROUP	WVWAP FACILITATED
Shaver's Fork Coalition	6/96	Yes	Yes
Middle Island Creek Conservation Group	1/90	No	No
White Day Creek Watershed Association	10/95	Yes	Yes
Upper South Branch Watershed Association	6/96	Yes	Yes
New Creek Valley Watershed Association	2/96	Yes	Yes
Davis Creek Watershed Association	6/95	Yes	Yes
Dunkard Creek Watershed Association	11/95	Yes	Yes
Wheeling Environmental Conservation Association	1/93	No	No
Helvetia Restoration & Development Association	1/67	Yes	No
Thorn Creek Watershed Association	10/96	Yes	Yes
Pine Cabin Run Ecol. Lab.	3/85	Yes	No
Blue Heron Environmental Network, Inc	4/91	Yes	No
Cairo Community Development Association	1/88	Yes	No
Lincoln County Development Authority	1/69	Yes	No
Lower Paint Creek Watershed Association	6/95	Yes	Yes
Bluestone Environmental Restoration Project	5/91	Yes	Yes
Downstream Alliance	4/91	Yes	No
Tibbs Run Watershed Association	10/95	No	No
Indian Creek Watershed Association	2/96	Yes	No
Decker's Creek Watershed Association	2/95	Yes	No
Moncove Lake State Park	1/90	Yes	No
Elk River Development Corporation	6/92	No	No
Marion Co. P&R Comm. West Fork River	6/96	Yes	No
Cheat Lake Env. & Rec. Association	6/92	Yes	No
Elkhorn Creek Watershed Association	3/96	Yes	Yes
Bakers Run Watershed Cons. Society	1/94	Yes	Yes
Friends of the Cheat	6/94	Yes	Yes
White Sulphur Streams	1/96	No	No
Lower West Fork Watershed Association	3/97	Yes	No
Greenbrier River Watershed Association	6/91	Yes	Yes
Friends of Spring Run Wild Trout	2/96	Yes	No
Tug River Watershed Association	7/96	No	No

categories. This organization had obtained about \$10,000 in financial resources over its lifetime with approximately three-fourths of its financial resources, which included at least one Stream Partners grant (Table 4), from outside the community. This organization used these financial resources to provide support activities (newsletters, promotional material, etc.) and to leverage in-kind contributions of labor, equip-

ment, and/or technical expertise to undertake watershed related activities. Typically, at least two distinct activities were undertaken, one at between \$1,000 - \$5,000 in size and the other at between \$5,000 - \$20,000. Common activities of watershed organizations included stream litter clean ups, fish stocking, stream restoration, and/or some type of stream monitoring or water quality studies.

Figure 2. Designated Regions in West Virginia and Distribution of Watershed Organizations.

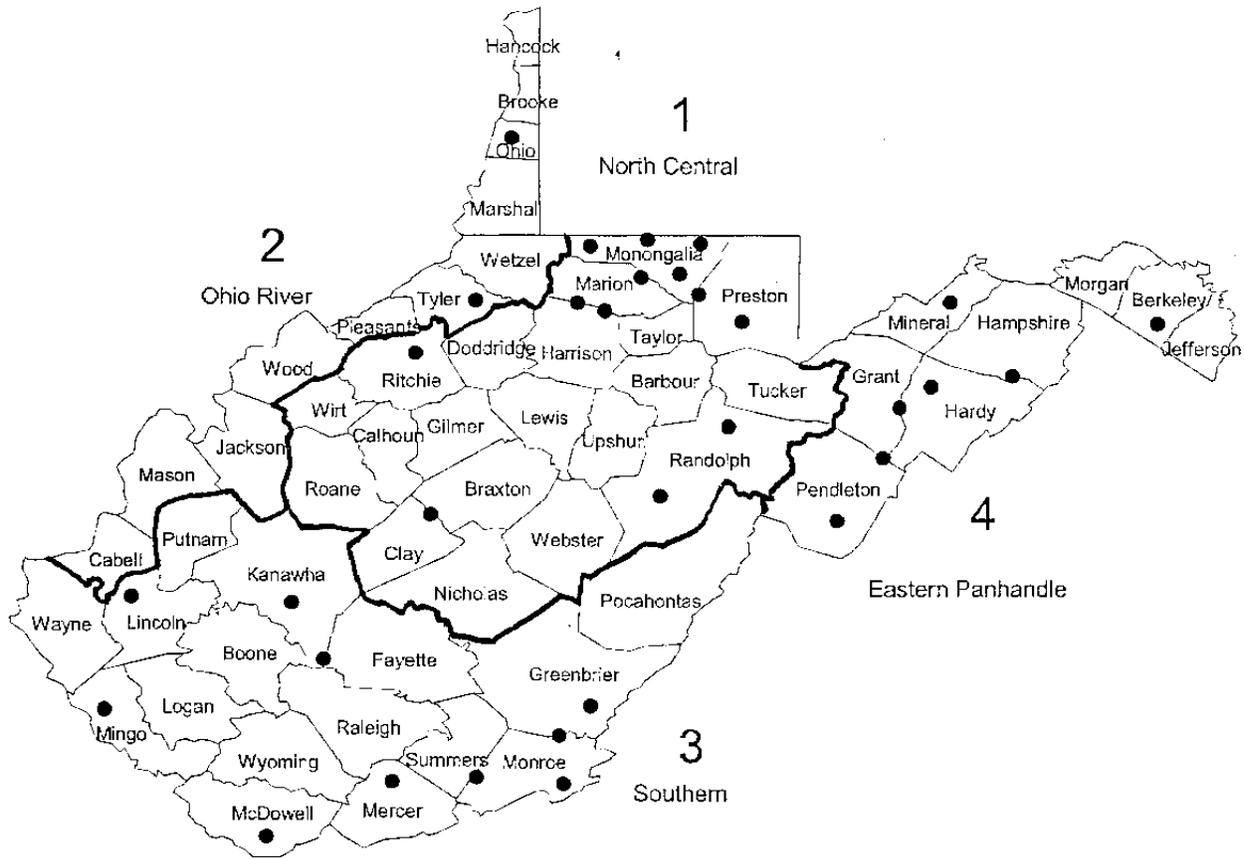


Table 3. Watershed Problems by Region as Cited by Watershed Organization Leaders.

Watershed Problem	Region 1 (n=14)	Region 2 (n=2)	Region 3 (n=9)	Region 4 (n=7)
Acid Mine Drainage	43%	0%	11%	0%
Non-point Pollution	64%	50%	67%	100%
Flooding	43%	0%	22%	43%
River Access & Use	21%	50%	56%	14%
Sewage	29%	50%	22%	0%
Point Source Pollution	7%	0%	11%	0%
Riparian Habitat	15%	0%	22%	0%
Low Water Levels	7%	0%	11%	0%
River Dredging	0%	50%	0%	0%
Land Use Planning	7%	0%	0%	0%

Table 4. Profile of a Typical West Virginia Watershed Organization Based upon Medians and Means from Survey Data.

Characteristic	Data
Formation Date	Spring 1995
Membership Size	
Mailing List	40
Active Participants	16
Number of Partners	
Total	10
By Type	
Local Government	2
State Government	2
Federal Government	1
Business & Industry	3
Environmental Groups	1
Non-Profit Organizations	1
Financial Resources Acquired	
Total	10,000
Outside Community	7,500
Within Community	2,500
Number of Funding Sources	
Total	3
Outside Community	2
Within Community	1
Number of Distinct Watershed Activities	2
Size of Activities	One between \$1,000 and \$5,000 One between \$5,000 and \$20,000

Watershed organizations have undertaken difference approaches to address watershed problems. Some organizations have taken action to directly solve problems, such as stream restoration and cleanup projects conducted by the Davis Creek Watershed Association and the Friends of Spring Run Wild Trout. Other organizations have focused less on direct action and

more on lobbying for and securing the assistance of state or federal agencies, such as the New Creek Valley Watershed Association to provide flood cleanup and protection. Some watershed problems like AMD and flood control are issues which local communities cannot easily address on their own. To address the need for a flood control dam, the Lincoln County Development Authority secured a large grant to perform the environmental and social impact assessment. The Downstream Alliance has conducted extensive water quality monitoring and has developed a map which describes the water quality, especially with regard to AMD, in all streams. This map allows the Alliance to educate legislators and state agencies about the severity of water quality problems.

Among those watershed organizations included in our survey, two are extremely successful organizations of note: the Lower Paint Creek Watershed Association and the Friends of the Cheat. Brief descriptions of these organizations, what these organizations have accomplished, and some keys to their success are provided below:

Lower Paint Creek Watershed Association has 775 people on its mailing list. 25 to 100 of whom attend monthly meetings. A description of this association is available on EPA's website at <http://www.epa.gov/owow/lessons> as an example of local partnerships which build on small successes. This organization has constructed a fishing pier, been involved in numerous stream litter cleanups, and has completed stream restoration work. Mr. Dwight Siemiaczko, the president, said he felt its success was due to organizing projects into doable parts-like tackling a fourteen mile stretch of Lower Paint Creek rather than the entire length-and advertising their efforts to encourage increased participation. Another possible reason for this association's success is the location of their watershed. It is close to Charleston, the state capital, so that state agencies responsible for water quality and state legislators can be showed the effects of cleanup activities here. Political connections with agency heads and state legislators also have helped direct state and federal dollars toward the problems in the watershed. Mr. Siemiaczko

was able to demonstrate the cost effectiveness of the creek's cleanup in terms of revenues from fishing. Lower Paint Creek has members from American Electric Power and Cyprus Amax (both contributors to the pollution problem), Environmental Protection Agency, state legislators, and West Virginia government agencies (Divisions of Environmental Protection and Natural Resources). Representatives from the Office of Surface Mining also attend its meetings and work with them.

The success of the Friends of the Cheat can be attributed to a number of factors. First, there is a national awareness of the plight of the Cheat River severe acid mine drainage from abandoned coal mines within the watershed. The Cheat River has been a regular nominee of the American Rivers organization's published list of the nation's Most Endangered Rivers. Watershed activists view the Cheat River as the poster child for nationwide watershed rehabilitation efforts. This national awareness is coupled with recognition of the Cheat River's outstanding historic, recreation, tourism, and biological significance and potential. Even with its AMD problems, the 11 mile Cheat Gorge section from Albright to Jenkins Bridge is one of the most popular white water boating sections in the region and supports a number of thriving outfitters and ancillary businesses. There is a strong belief that if AMD problems can be mitigated, the Cheat River can spawn the same economic development success from white water recreation as the New and Gauley rivers in southern West Virginia. The Friends of the Cheat have promoted this awareness with an annual riverfest and have effectively utilized this awareness to successfully compete for AMD reclamation funds available from: federal agencies (such as the EPA and Office of Surface Mining), state agencies such as the WV Division of Environmental Protection, and private coal mine operators.

Inclusiveness Impact on Watershed Organizations

This comparison was made to examine the impact of inclusiveness on watershed organization effectiveness. Inclusive watershed organizations were categorized as those that had more than the median number of partners. These

organizations were younger (median formation date of fall 1995 vs. winter 1993) and had slightly greater membership than less inclusive organizations (Table 5). All inclusive organizations were active compared to only 65% of less inclusive organizations.

The results of Table 5 show that inclusive watershed organizations were clearly more effective than less inclusive in acquiring resources and undertaking activities. Inclusive organizations acquired about three times the amount of resources on both total and per capita annual bases. Inclusive organizations had more success in acquiring financial resources both outside the community (median per capita annual rate of \$0.74 vs. \$0.23) and within the community (mean per capita rate of \$0.17 vs. \$0.08). These differences were not statistically significant based on t-test results. Inclusive organizations also undertook three times as many watershed activities as less inclusive organizations. The difference in mean ACTIVITIES was statistically significant at $p=0.05$ level ($t_{30}=2.1$).

Leader opinions among inclusive organizations showed little differences compared with less inclusive, even for perceptions of stakeholder representation (Table 5). Only in overall satisfaction with their watershed organization were the leaders' opinions higher for inclusive organizations compared to less inclusive.

The Impact of WVVAP Facilitation on Watershed Organizations

Comparisons were made between WVVAP facilitated watershed organizations and those that were not facilitated by the WVVAP. These comparisons were based upon active organizations at the time of the interview. Table 3 indicates those organizations which were facilitated by the WVVAP. Given the recent occurrence of facilitation services, WVVAP facilitated organizations, as expected, were in existence less time with a median formation date of fall 1995 compared to non-facilitated organizations with a median formation date of four years earlier, fall 1991.

Table 5. Comparison between Inclusive and Less Inclusive Watershed Organizations.

	INCLUSIVE (N = 15)			LESS INCLUSIVE (N = 17)		
PARTNERS	Median 15	Mean 19	Range 11 - 49	Median 6	Mean 6	Range 1 - 10
TYPE OF PARTNERS		Mean			Mean	
Local Government		3			1.6	
State Government		2			1.4	
Federal Government		2			0.6	
Business & Industry		7			0.4	
Environmental Groups		1.6			1	
Recreation Groups		0.9			0.06	
Landowners		0.5			0.3	
Non-Profit Organizations		2			0.8	
MEMBERSHIP	Median	Mean	Range	Median	Mean	Range
Mailing list						
Total	70	198	7 - 1,000	28.5	242	0 - 3,200
Per 1000 population	3.6	9.3	0.2 - 33	2.3	11.1	0 - 80
Active Participants						
Total	15	21	5 - 40	12	12.8	0 - 20
Per 1000 population	0.9	2.0	0.1 - 10	0.5	4.9	0 - 66
ACTIVITIES	Median	Mean	Range	Median	Mean	Range
Median	3	3.1	1 - 9	1	1.6	0 - 5
ACQUIRED RESOURCES	Median	Range		Median	Range	
Total	\$15,200	\$5,000 - \$750,000		\$5,500	\$0.00 - \$181,500	
Per Capita Annually	\$0.79	\$0.14 - \$2.59		\$0.23	\$0.00 - \$18.46	
LEADER OPINIONS ^a		Mean			Mean	
* Trust among members		5.6			5.5	
* All stakeholders represented in organization		4.5			4.4	
* Administrative support from government		5.4			5.5	
* Overall satisfaction with organization		5.6			4.8	
^a Measured on a likert scale from 1 (strongly negative) to 7 (strongly positive)						

Since one of the goals of the facilitation process was to include all watershed stakeholders in the organization, our assumption was that the process of facilitation would lead to a higher level of inclusiveness within watershed organizations. The results do not indicate that a higher level of inclusiveness existed in WWAP

facilitated organizations. The median results for both categories showed the same number of organizational partners (Table 6). In addition, partner types were evenly distributed for both facilitated and non-facilitated organizations—the main differences being more business & industry and non-profit organizations in facilitated

than non-facilitated. WVVAP facilitated organizations did have a higher mean of partners, but it was not significantly different from non-facilitated based on t-test results ($t_{24}=1.05$). This higher mean was due to large numbers of partners by two organizations (Friends of the Cheat with 49 and Lower Paint Creek Watershed Association with 33) which have been very successful in bringing many partners into their organizations. The inclusiveness variable was approximately equal for facilitated and non-facilitated (3.0 versus 3.09). Based upon these results, the inclusiveness aspect of the WVVAP did not result in either a larger number or more diversity of partners as would be expected of these organizations.

Although the number of partners was similar, WVVAP facilitated organizations did have much larger mailing lists and more active members, both in terms of total number and per 1,000 population (Table 6). WVVAP facilitated organizations also engaged in a greater number of diverse watershed activities. The number of activities for WVVAP facilitated was twice as large as for non-facilitated (Table 6). The difference in mean ACTIVITIES was statistically significant at $p = 0.05$ using a t-test ($t_{24}=2.4$). This result was interpreted to be reflective of a greater diversity of interests which was being pursued by WVVAP facilitated organizations in response to the partners of these organizations. Conversely, non-facilitated watershed organizations brought in as many partners into their organizations, but they tended to be organized to address single watershed issues, such as flooding. In addition to a greater number of distinct activities per organization, WVVAP facilitated organizations have undertaken a greater number of large sized projects requiring over \$100,000 in resources (Table 6).

In the acquisition of financial resources, both categories have had roughly the same level of success. Median per capita acquisition on an annual basis was slightly higher for WVVAP facilitated organizations (median of \$0.79 vs. \$0.56). A t-test showed the means for per capita resources acquired annually (facilitated = \$3.09 versus non-facilitated = \$1.04) were not

significantly different ($t_{24}=0.48$). The big difference between these two categories was in the source of financial resources. WVVAP facilitated organizations were much more successful in securing financial resources from outside the watershed community (median per capita annual rate of \$0.74 vs. \$0.28) using more outside funding sources (median of 3 vs. 1). WVVAP facilitated groups were less successful than non-facilitated organizations within the community with lower per capita annual funds raised (mean of \$0.10 vs \$0.18) and fewer within community fund-raising sources (mean of 1 vs. 2).

Leader opinions among WVVAP facilitated organizations showed higher levels of: trust among members, perceptions of stakeholder representation and government support, and overall satisfaction with their watershed organization than leaders of non-facilitated organizations (Table 6). The differences were not large but they were in a consistent direction.

The Impact of Stream Partners Program on Watershed Organizations

Most of the 32 organizations interviewed had received a Stream Partners grant-only nine had not received a grant. The organizations receiving Stream Partners grants were much younger, median formation date of fall 1995 compared to a median formation date of 1991 for organizations without a grant. Stream Partners grant recipients had a much higher percentage of active organizations (91%) than non-recipient organization (56%). Contingency table results rejected independence between active organization and grant recipient status at $p=0.025$ level ($\chi^2_1 = 5.41$). Thus, receipt of this grant can be regarded as important for organizational survival. Based upon our observations, financial grants from outside the community, like Stream Partners, are leveraged by watershed organizations with local, in-kind resources to undertake watershed activities. Without acquisition of a grant such as from the Stream Partners program, community support for the watershed organization and its activities is more difficult to achieve.

Table 6. Comparison between WWWAP Facilitated and Non-Facilitated Watershed Organizations.

	WWWAP FACILITATED (N = 13)			NON-FACILITATED (N = 14)		
PARTNERS	Median 11	Mean 16	Range 3 - 49	Median 11	Mean 11	Range 1 - 25
TYPE OF PARTNERS		Mean			Mean	
Local Government		2			2	
State Government		2			2	
Federal Government		1			1	
Business & Industry		6			2	
Environmental Groups		1.5			1	
Recreation Groups		0.7			0.4	
Landowners		0.4			0.5	
Non-Profit Organizations		2			1	
MEMBERSHIP	Median	Mean	Range	Median	Mean	Range
Mailing list						
Total	75	209	10 - 1,000	27.5	31.5	6 - 3,200
Per 1000 population	5.4	15	0.2 - 66	1.5	8.8	0.1 - 80
Active Participants						
Total	20	23	5 - 40	15	14.1	7 - 25
Per 1000 population	1.2	6.7	0.1 - 66	0.5	1.4	0.1 - 10
ACTIVITIES	Median	Mean	Range	Median	Mean	Range
Median	4	3.7	0 - 9	1.5	1.8	0 - 5
SIZE OF ACTIVITIES (Count of all organizations)						
Under \$1,000		9			4	
\$1,000 tto \$5,000		20			11	
\$5,000 to \$20,000		10			6	
\$20,000 to \$100,000		5			5	
Over \$100,000		5			1	
ACQUIRED RESOURCES	Median	Range		Median	Range	
Total	\$10,000	\$5,000 - \$673,000		\$12,500	\$0.00 - \$750,500	
Per Capita Annually	\$0.79	\$0.07 - \$18.45		\$0.56	\$0.00 - \$7.07	
LEADER OPINIONS ^a		Mean			Mean	
• Trust among members		5.7			5.2	
• All stakeholders represented in organization		4.6			4.2	
• Administrative support from government		5.3			4.8	
• Overall satisfaction with organization		5.4			4.1	
^a Measured on a likert scale from 1 (strongly negative) to 7 (strongly positive)						

Table 7. Comparison between Recipients and Non-recipients of Stream Partners Grants.

	GRANT RECIPIENTS (N = 23)			NON-RECIPIENTS (N = 9)		
WATERSHED SIZE	Median	Mean		Median	Mean	
Population	29,500	34,600		\$13,500	15,300	
Number of Counties	2	1.9		1	1.1	
PARTNERS	Median	Mean	Range	Median	Mean	Range
	10	13	1 - 49	10	9	1 - 18
TYPE OF PARTNERS		Mean			Mean	
Local Government		1.6			3	
State Government		2			1	
Federal Government		1			1	
Business & Industry		4			2	
Environmental Groups		1.6			0.4	
Recreation Groups		0.5			0.3	
Landowners		0.4			0.4	
Non-Profit Organizations		1			0.6	
MEMBERSHIP (Medians)	Median	Mean	Range	Median	Mean	Range
Mailing list						
Total	43	288	0 - 3,200	31	40	6 - 142
Per 1000 population	2.9	13	0 - 81	1.8	2.7	0.5 - 10.5
Active Participants						
Total	15	19	0 - 75	12	12	4 - 25
Per 1000 population	0.8	4.1	0 - 66	0.5	1.9	0.3 - 1.9
ACTIVITIES	Median	Mean	Range	Median	Mean	Range
	3	2.7	0 - 9	1	1.4	0 - 3
ACQUIRED RESOURCES	Median	Range		Median	Range	
Total	\$10,000	\$1,000 - \$673,000		\$11,500	\$0.00 - \$750,000	
Per Capita Annually	\$0.74	\$0.07 - \$18.45		\$0.12	\$0.00 - \$1.21	
LEADER OPINIONS ^a		Mean			Mean	
• Trust among members		5.7			5.1	
• All stakeholders represented in organization		4.2			4.9	
• Administrative support from government		5.3			3.2	
• Overall satisfaction with organization		5.4			4.6	
• Organizational goals are expanding		5.5			4.3	
^a Measured on a likert scale from 1 (strongly negative) to 7 (strongly positive)						

The data in Table 7 show that Stream Partners grants were awarded to larger watershed organizations which serve greater populations in multi-county watershed areas. The mean watershed population of Stream Partners grant recipients was statistically larger ($t_{29}=2.66$) at the $p=0.01$ level. Being from larger watersheds, recipient organizations had slightly larger mailing lists and active participant members than non-recipients, even when adjusted for watershed population. These larger memberships illustrate the importance of grant acquisition in enhancing community support.

As with WVVAP facilitation, the number of partners was approximately the same for recipients and non-recipients. The means were not statistically different ($t_{30}=1.02$). Grant recipients did have a greater diversity of partners among all levels of government, business & industry, environmental groups, and non-profit organizations. Non-recipient partners were concentrated in government (particularly local) and business & industry. Environmental groups and non-profit organizations were less represented in non-recipient organizations.

Despite their younger age, Stream Partners grant recipients have undertaken at least double the number of distinct activities as non-recipients. The difference in mean activities was statistically significant at the $p=0.05$ level ($t_{28}=2.05$). These activities were larger in size as recipients averaged 1.2 activities being undertaken over \$5,000 in size while, non-recipients averaged less than 0.5. Grant recipients also have raised almost the same amount of total financial resources as non-recipients during their short tenure. On a per capita annual basis, Stream Partners grant recipients have been much more successful in acquiring financial resources, due, in part, to their acquisition of one or more Stream Partners grants. This difference was statistically significant at the $p=0.05$ level ($t_{23}=2.09$).

Leader opinions among Stream Partners grant recipients showed much higher levels of perceptions of government support and expanding goals of the watershed organization than non-recipient organizations (Table 7). This

result is not surprising given the receipt of a Stream Partners grant should enhance leader opinions in both these areas. Overall satisfaction with their watershed organization and trust among members also were higher among recipients. Surprisingly, leader perceptions of stakeholder representation were lower among recipient organizations.

Comparison between Grassroot and Non-Grassroot Watershed Organizations

By bringing together individuals and organizations throughout the watershed community, grassroot watershed organizations involved more partners and had larger mailing lists and more active members than non-grassroot organizations (Table 8). Grassroot organizations had a higher percentage of active organizations (86% versus 72%) and were much more likely to have been facilitated by the WVVAP (62% versus 9%). Similar to the Stream Partners comparison, grassroot organizations had a greater diversity of partners among all levels of government, business & industry, environmental groups, and non-profit organizations. Non-grassroot organizations' partners were concentrated in government (particularly local) with some representation in business & industry and environmental groups.

Reflecting their diversity of interests, grassroot watershed organizations were involved in three times the number of distinct activities as non-grassroot organizations. Total and per capita annual financial resource acquisitions, however, were about equal between the two categories (Table 8). These results reflect the greater ability of grassroot organizations to utilize in-kind resources from the community to undertake watershed activities. Grassroot organizations were able to acquire about twice the amount of resources from outside the community as non-grassroot organizations (\$0.39 versus \$0.18 per capita annually). Leader opinions among grassroot watershed organizations showed much higher levels of: trust among members, perceptions of stakeholder representation and government support, and overall satisfaction with their watershed organization than leaders of non-grassroot organizations (Table 8).

Table 8. Comparison between Grass Root Watershed Organizations and Non-Grass Root Organizations.						
	GRASS ROOT ORGANIZATIONS (N = 21)			NON-GRASS ROOT ORGANIZATIONS (N = 11)		
PARTNERS	Median 11	Mean 14	Range 1 - 49	Median 6	Mean 8	Range 1 - 17
TYPE OF PARTNERS		Mean			Mean	
Local Government		1.8			2.5	
State Government		2			1	
Federal Government		1.5			0.7	
Business & Industry		4.7			1	
Environmental Groups		1.5			1	
Recreation Groups		0.5			0.3	
Landowners		0.4			0.4	
Non-Profit Organizations		1.5			0.7	
MEMBERSHIP	Median	Mean	Range	Median	Mean	Range
Mailing list						
Total	50	159	0 - 1,000	11	368	6 - 3,200
Per 1000 population	3.0	10.4	0 - 66	1.0	9.9	0.1 - 80
Active Participants						
Total	15	19.6	0 - 40	11	11	4 - 16
Per 1000 population	1.0	4.4	0 - 10	0.5	1.5	0.2 - 10
ACTIVITIES	Median	Mean	Range	Median	Mean	Range
Median	3	2.9	0 - 9	1	1.3	0 - 3
ACQUIRED RESOURCES	Median	Range		Median	Range	
Total	\$10,000	\$1,000 - \$673,000		\$11,500	\$0.00 - \$750,000	
Per Capita Annually	\$0.74	\$0.07 - \$40.00		\$0.74	\$0.00 - \$35.05	
LEADER OPINIONS ^a		Mean			Mean	
• Trust among members		5.8			4.8	
• All stakeholders represented in organization		4.7			3.8	
• Administrative support from government		5.2			3.4	
• Overall satisfaction with organization		5.6			4.1	
^a Measured on a likert scale from 1 (strongly negative) to 7 (strongly positive)						

Coefficient Estimation in Regression Analysis

OLS regression analyses were conducted with the dependent variables of: 1) the number of distinct activities (ACTIVITIES); and 2) financial resources acquired per capita annually

(RESOURCES). These dependent variables provided indicators of watershed organizational effectiveness. Independent variables to explain effectiveness included: the number of partners in the organization (PARTNERS), WWWAP facilitation (WWWAP), active members per

1000 population (MEMBERS), whether or not the organization was grassroot (GRASS-ROOTS), receipt of a Stream Partners grant (STREAM), watershed population (POPULATION), watershed problem of AMD or flooding (if yes, PROBLEM=1, otherwise zero) and leadership opinion on stakeholder inclusion (OPINION). A complete list of data utilized is provided in Appendix D.

To explain ACTIVITIES, model 1 had only the PARTNERS variable with a coefficient estimate which was statistically different from zero (Table 9). Model 2, selected through stepwise regression³, included PARTNERS and

WVWAP variables, both with statistically significant, positive coefficients. Both models 1 and 2 were statistically significant at the p=0.01 level based on F tests.

As an indicator of effectiveness, the number of partners proved to be the best predictor of the number of distinct activities. More partners in watershed organizations led to more watershed activities. The larger the number of partners indicates not only a greater diversity of interests in the watershed resource but also more potential contributors who are able to provide the resources necessary for an organization to undertake activities. Confirming the

Table 9. OLS Regression Models to Explain the Number of Distinct Activities by Watershed Organizations.

Variables	Model 1 Coefficient Estimates (Standard Errors)	Model 2 Coefficient Estimates (Standard Errors)
Dependent		
ACTIVITIES		
Independent		
CONSTANT	-0.178 (0.629)	0.246 (0.476)
PARTNERS	0.103 ** (0.025)	0.125 ** (0.029)
WVWAP	1.393 (0.744)	1.293 * (0.568)
STREAM	-0.920 (0.889)	
GRASSROOTS	0.745 (0.738)	
MEMBERS	0.036 (0.025)	
POPULATION	0.023 (0.013)	
	n=30 Adjusted R ² = 0.492 F _{6, 24} = 5.834	n=30 Adjusted R ² = 0.485 F _{2, 28} = 15.103

* statistically significant at the 0.05 level

** statistically significant at the 0.01 level

comparisons made earlier, WWAP facilitated organizations were found to be engaged in a statistically larger number of distinct activities. Thus, the organizations developed under this state program were responding to the interests of the partners involved in these organizations by undertaking more activities than non-facilitated organizations.

To explain RESOURCES, Model 1 results showed that none of the independent variables explained financial resource acquisition with statistically significant coefficient estimates (Table 10). State policies, watershed characteristics, and inclusiveness measures did not explain

effectiveness as measured by financial resource acquisition. Based upon an F test, this model was not statistically significant. Stepwise regression was utilized to select Model 2. This model had the OPINION variable with a positive coefficient which was statistically different from zero. The positive coefficient means that the stronger a leader's agreement with a statement about organizational inclusion of all key stakeholders and interests in the watershed, the greater the amount of resources acquired by their watershed organization. Thus, leader perception of inclusiveness was linked to effectiveness in resource acquisition, but the number of

Table 10. OLS Regression Models which Explain the Financial Resources Acquired Per Capita on an Annualized Basis by Watershed Organizations.

Variables	Model 1 Coefficient Estimates (Standard Errors)	Model 2 Coefficient Estimates (Standard Errors)
Dependent		
RESOURCES		
Independent		
CONSTANT	-2,790.5 (3,093)	-2,891.7 (2,383.2)
PARTNERS	-79.1 (93.2)	
WWAP	2,468.6 (2,255.4)	
STREAM	1,736.0 (2,400.7)	
POPULATION	-45.94 (31.58)	
OPINION	771.0 (552.6)	1,067** (509.1)
PROBLEM	2,662.6 (2,045.1)	
	n=24	n=23
	Adjusted R ² = 0.184	Adjusted R ² = 0.129
	F _{5, 20} = 1.904	F _{1, 22} = 4.393

* statistically significant at the 0.05 level

** statistically significant at the 0.01 level

partners was not. This model was statistically significant at the $p=0.05$ level based upon an F test.

The MEMBERS variable had a statistically significant coefficient when it was included in a model explaining RESOURCES as an independent variable (and not reported in Table 10). However, this variable was not included in the Table 10 results because the line of causation was ambiguous: Do more members create the necessary human resources to acquire financial resources or does the acquisition of resources attract more members?

Conclusions and Implications for State Policy

Inclusiveness is an important characteristic of successful watershed associations. The descriptive results confirm that the majority of watershed organizations in our sample were quite inclusive—with representation from many sectors of the state and local community. Overall, 81% of watershed associations participating in the study had at least three of the four categories in the INCLUSIVE variable. Our measures of inclusiveness for watershed organizations indicated that a higher level of inclusiveness led to greater organizational effectiveness in terms of financial resources acquired and watershed activities. The number of partners had a statistically significant, positive impact on explaining the number of distinct watershed activities undertaken by an organization. Organizations with more partners acquired a greater level of financial resources. In addition, leader perception of inclusiveness was statistically related to acquisition of financial resources. However, the diversity of partners as indicated by the type of partners and whether or not they represented all interested stakeholders in the watershed did not influence the ability of watershed organizations to undertake activities or acquire financial resources. Inclusiveness was observed to be an important component for organizational survival, especially with certain types of watershed issues like non-point pollution.

Results from the study confirm that the greater the number of organizational partners involved in a watershed organization, the greater the diversity of activities undertaken by the group. Clearly, more partners means more interests, contacts, and community involvement. This result does not necessarily mean that larger groups are better able than smaller groups to achieve organizational goals, only that they tend to support a wider range of activities. Leadership qualities, as measured by our survey, were not found to be related to watershed activities or resources acquired. Successful watershed organizations (like Lower Paint Creek Watershed Association and Friends of the Cheat River) do require that leaders are able to work well with both private and public interests.

This research makes a compelling case for state level assistance to watershed organizations. One type of assistance was a “birthing and growing” of watershed organizations provided by the West Virginia Watershed Assessment Program (WVWAP). Organizations facilitated by the WVWAP had more members, were able to acquire more financial resources outside the community, and undertook a statistically greater number of watershed activities which were larger in size. WVWAP facilitated watershed organizations were not found to be more inclusive of watershed stakeholders as was initially expected. However, given the importance of the number of partners, our results are supportive of the view that the WVWAP did accelerate the formation of effective watershed organizations by forcing local organizers to seek out partners from watershed stakeholders that would be needed to insure organizational survival and by vesting the organizers’ effort with more legitimacy and support.

The other type of state level assistance is small grants (up to \$5,000) provided by the Stream Partners Program. These grants provide a relatively inexpensive (about \$100,000 in grants annually plus administrative costs) means to ensure survival and rapid maturity of watershed organizations. Stream Partners grants have

been very successful in promoting watershed organizational survival. The Stream Partners grants were observed to be distributed to watershed organizations serving larger populations and multi-county areas. This distribution has watershed, social, and political explanations. From a watershed perspective, a grant provides financial resources from outside the community which can be leveraged with in-kind, community resources to undertake watershed activities which will benefit the entire watershed area. Larger watershed organizations with greater population bases may have a higher level of social capital and thus are able to prepare better grant proposals and commit more matching resources. The political perspective is that watershed organizations which serve greater populations and larger areas are better able to effectively apply political pressure for grant funds and have a sufficient number of voters necessary to attract state level financial support.

There are many different forms of effective watershed organizations so that no one organizational blueprint exists for a successful grass-roots group. Effective watershed organizations participating in the study can be categorized loosely into three categories. The first category includes those organizations whose members were: largely volunteer (their watershed organization duties were not part of other professional responsibilities); recruited from a relatively small stream or creek watershed to obtain a high degree of ownership among local residents; organizationally diverse with multi-faceted missions; and able to attract a large number of local partners. Friends of Spring Run Wild Trout, Davis Creek Watershed Association, and Dunkard Creek Watershed Association are examples of this type of organization. The second type of organization had a narrowly focused watershed mission (mainly issues related to flooding), was involved in a lower number of distinct watershed activities, tended to be domi-

nated by economic development and resource management professionals, and had a smaller number of partners with a less inclusive mix of watershed stakeholders. Examples included the Lincoln County Development Authority and the New Creek Watershed Association. In the third category, organizational leaders were able to combine elements of both one and two to form successful organizations that obtained high levels of both local and outside community support. This category included the watershed organizations described earlier—the Lower Paint Creek Watershed Association and the Friends of the Cheat.

In conclusion, there are many social, economic, and political factors affecting watershed organization effectiveness over which the state has little control or influence. These factors include: 1) the severity of the water quality problem; 2) public awareness of watershed problems; 3) the existence of a crisis event in the watershed; and 4) the existing social capital within the watershed community. In spite of these external factors, results from this study suggest two program strategies that can help local watershed organizations succeed. These strategies should include: 1) cost sharing grants which have partnerships among watershed stakeholders as an explicit grant proposal evaluation criteria; and 2) facilitation assistance which focuses on watersheds where there exist chronic, non-crisis problems (such as generalized non-point pollution). Since inclusiveness is crucial in many cases to a watershed organization's survival, grants should be targeted towards those organizations that show a commitment to forming partnerships. In watersheds with chronic problems, organizations probably would not exist if facilitation services were not available. These strategies should be viewed as not only a means to achieve watershed improvement, but also as a way to build a grassroots constituency for watershed issues.

Appendix A - Summary of Watershed Organization Case Studies

Watershed Organizations in the Literature

1. Reference: Beier and Langheinrich (1996)

Name: **The Umatilla Basin Watershed Council**

Location: northeastern Oregon

Watershed problem: water quality and quantity

Stakeholders: ranchers, farmers, attorneys, businesses, foresters, tribal leaders, and agency representatives

2. Reference: Duyvejonck (1994)

Name: **Upper Mississippi River Conservation Committee**

Location: Mississippi

Watershed problem: sedimentation, stream channelization, levees separating the river from its flood plain, water level controls, industrial and municipal point source pollution and agricultural run off

Stakeholders: a consortium of river quality professionals

3. Reference: Frech, Barscz, and Tyler (1996)

Name: **Nantioke Watershed Alliance**

Location: Maryland, Delaware

Watershed problem: habitat for many endangered species

Stakeholders: many companies, state governments, national government agencies, environmental groups and local citizens

4. Reference: Poppe, Hurst, and Burks (1997)

Name: **River Action Teams**

Location: Tennessee

Watershed problem: increase water quality

Stakeholders: Tennessee Valley Authority (TVA); federal, state, and local agency personnel; local businesses; community members

5. Reference: Powell, Ball, and Bails (1996)

Name: **Rouge River National Wet Weather Demonstration Project**

Location: Michigan

Watershed problem: wet weather pollution

Stakeholders: federal, state, and local groups

6. Reference: Richman (1996)

Name: **French Creek Watershed Advisory Group**

Location: northern California

Watershed problem: sedimentation from dirt roads

Stakeholders: government, industry, community, and environmental groups

7. Reference: Schroedel, Sherman, and McCarty.(1998)

Name: **Rock River Watershed Partnership**

Location: Wisconsin

Watershed problem: nutrient and other water quality issues

Stakeholders: pollutant dischargers, local groups, NRCS, parks and recreation district

8. Reference: Williams (1997)

Name: **Operation Future**

Location: central Ohio

Watershed problem: protect the watershed and sustain the farming families in the watershed

Stakeholders: farmers; environmentalists; federal, state, and local government agency representatives

3. <http://www.merrimack.org>

Name: **Merrimack River Watershed Council**

Location: New Hampshire, Massachusetts

Watershed problem: many industrial and municipal discharges, many combined sewer overflows (CSO's)

Stakeholders: EPA, state governments (NH and MA), citizens and businesses

Watershed Organizations and Internet sites.

1. <http://www.gmu.edu/bios/Bay/acb/index.htm>

Name: **Alliance for the Chesapeake Bay**

Location: Washington D.C., Maryland, Pennsylvania, Virginia

Watershed problem: Many issues—fish harvesting, restoration of water quality

Stakeholders: General public, private sector and government

4. <http://www.edc.uri.edu/rreapage/h20watch/partners.htm>

Name: **URI Watershed Watch Partnership**

Location: Rhode Island

Watershed problem: water quality monitoring

Stakeholders: URI Cooperative Extension, State of RI, and local organizations

2. <http://www.austin360.com/greenzone/bcf/index.htm>

Name: **Bull Creek Foundation**

Location: Austin, Texas

Watershed problem: protecting natural resources and encouraging compatible growth

Stakeholders: community members, government and companies

5. <http://www.frog.org>

Name: **The Friends of the Garcia River (FrOG)**

Location: California (Medocino County)

Watershed problem: Logging pollution affecting salmon habitat

Stakeholders: local citizens, local water agency, NOAA, National Weather Service

6. <http://www.riverpage.com>

Name: **St. John's River Native Network**

Location: northeast, north-central, and east-central Florida

Watershed problem: draining of marshes, flood control

Stakeholders: local citizens

7. <http://www.traverse.com/nonprof/gtbwi/agree.html>
Name: **Grand Traverse Bay Watershed Initiative**
Location: Michigan
Watershed problem: keeping the watershed relatively unpolluted
Stakeholders: government, education, economic development groups, special interest groups and private sector
8. <http://www.wln.com/~crc>
Name: **Chehalis River Council**
Location: Washington
Watershed problem: water quality, water resources, and water issues
Stakeholders: local citizens
9. <http://www.pugetsound.org>
Name: **People for Puget Sound**
Location: Washington
Watershed problem: marine waters, habitat protection, marine sanctuary, sewage, industrial pollution, sound economy, environmental justice
Stakeholders: local citizens
10. <http://www.riverscouncilofwa.org>
Name: **Rivers Council of Washington**
Location: Washington
Watershed problem: to preserve, enhance and restore rivers and their watersheds in WA
Stakeholders: local citizens
11. <http://www.scn.org/earth/savelake>
Name: **Save Lake Sammamish**
Location: Washington
Watershed problem: promoting the water quality of the lake (problem with algae bloom)
Stakeholders: local citizens
12. <http://www.inetone.net/Greenbrier-River-Watershed>
Name: **Greenbrier River Watershed Association**
Location: West Virginia
Watershed problem: to promote preservation of the river
Stakeholders: local citizens
13. <http://www.fotsjr.org/index.html>
Name: **Friends of the St. Joe River Association Inc.**
Location: Michigan and Indiana
Watershed problem: garbage dumping, fish population needs replenishing
Stakeholders: community members, funding from foundations and companies
14. <http://www2.inetdirect.net/~ecoindy/orgs/fosc>
Name: **Friends of Sugar Creek, Inc.**
Location: Indiana (Montgomery County)
Watershed problem: including Sugar Creek in the State Natural and Scenic Rivers Program
Stakeholders: local citizens

15. <http://www.surf-ici.com/fowr>
Name: **Friends of the White River**
Location: Indiana
Watershed problem: improve water quality, improve wildlife habitat in and along river
Stakeholders: citizens and recreationists
16. <http://www.savethesound.org/LISWA.htm>
Name: **Save the Sound, Inc.**
Location: New York and Connecticut
Watershed problem: to protect and restore the water quality of the estuary
Stakeholders: alliance of over 200 local groups (fishing, boating, environmental groups)
17. <http://trfn.clpgh.org/awnpec>
Name: **The Allegheny Watershed Network**
Location: Pennsylvania
Watershed problem: bringing stakeholders together
Stakeholders: PA Environment Council (funded by Heinz endowment) citizens groups and government
18. <http://www.brsf.org>
Name: **Buffalo River Stewardship Foundation**
Location: Arizona
Watershed problem: working with farmers to protect water quality
Stakeholders: educators, citizens, farmers, lawyers, recreationists
19. <http://www.wp.com/endview/home.html>
Name: **Citizens to Save Endview**
Location: Newport News, Virginia
Watershed problem: rezoning of fragile watershed area to build a mall
Stakeholders: citizens, legislative delegates, environmental organizations
20. <http://darkwing.uoregon.edu/~gries>
Name: **The South Santiam Watershed Council**
Location: Oregon (Willamette basin)
Watershed problem: habitat improvements, developing school curricula
Stakeholders: individuals, landowners, businesses, organizations, tribes, schools, government
21. <http://www.dartmouth.edu/acad-inst/nhrivers/index.html>
Name: **New Hampshire Rivers Council**
Location: New Hampshire
Watershed problem: conservation and ecologically sound management of NH's rivers and watersheds
Stakeholders: individuals from communities, local organizations and politicians

Appendix B

Brief Descriptions of Watershed Organizations in West Virginia.

West Virginia was divided up into four regions to categorize watershed organizations: (1) North Central; (2) Ohio River; (3) Southern; and (4) Eastern Panhandle. Watershed organizations are listed under the river, creek, or lake watersheds where they operate.

NORTH CENTRAL REGION:

BUCHANNON RIVER

The watershed problem in this area stemmed from flooding that occurred in the small town of Helvetia (population of about 200) located in Randolph County. Two floods in July 1996 caused considerable damage within the town. The WV Soil Conservation Agency responded to local concerns about the flooding damage by construction of a stream bank re-enforced by rit-rap. This construction extended over 500 feet in length along the Upper Trout Run and Left Fork of the Buchannon River. Subsequent local action took place to beautify this reconstructed stream bank. Aesthetics are important to Helvetia residents because of tourism, particularly in the fall when a Swiss Festival is held. A Stream Partners grant was obtained in 1997 and volunteer labor was used to plant trees and shrubs along the stream bank. This activity was coordinated through the Helvetia Restoration and Development Organization. Due to the small size of the town, no permanent watershed organization has been formed here, rather the coordination of this watershed activity was accomplished through an existing non-profit organization whose mission includes promoting educational and economic well being of Helvetia.

CHEAT LAKE

The Cheat Lake Environment and Recreation Association (CLEAR) was formed

in 1992 and operates in Monongalia County, specifically the Cheat Lake area. Pollution, limited recreational access to the lake, and mismanagement of Cheat Lake's recreation potential are problems which CLEAR addresses. CLEAR strives to involve the community in its environment to bring an end to these problems. CLEAR encourages state government action to build hiking and biking paths, camp sites, and canoe access docks. The Federal Energy Regulatory Commission, National Park Service, West Virginia Division of Natural Resource (WV-DNR), West Virginia Division of Environmental Protection (WV-DEP), the Monongalia County Commission, Anker Energy, Sierra Club, WV Rivers Coalition, landowners, recreationists and various other groups have participated in meeting the goals of CLEAR. Public meetings, newsletters, and board meetings are examples of how CLEAR obtains community action. Much of CLEAR's efforts are spent in negotiating politics and legislative actions to improve the Cheat Lake area. Membership donations and grants from the state and county governments have provided financial assistance to operate the organization and assess the recreation needs of the Cheat area.

CHEAT RIVER

The entire Cheat River watershed is the geographic area of operation for the Friends of the Cheat. This organization formed in the summer of 1994 after an underground mine "blowout" occurred, spilling millions of gallons of acid water into the Muddy Creek tributary of the Cheat River. Acid mine drainage (AMD), timbering, misuse of land, and improper sewage disposal are the problems addressed by this organization. Limestone treatments of AMD, chemical analysis, top soiling, and river cleanups have been implemented by the group through volunteer work. Extensive fund-raising activities, such as the annual Cheat Fest and direct solicitation, have provided organizational support. Friends of the Cheat also have acquired

grants from the WV-DEP, Recreational Equipment Inc. (REI), the U.S. Environmental Protection Agency (EPA), the Stream Partners Program, and the Canaan Valley Institute. Stakeholders include the Office of Surface Mining, EPA, WV-DEP, WV-DNR, West Virginia University, the Preston County Commission, Anker Energy, River Network, Downstream Alliance, WW Outfitters, Allegheny Power, Rotary Club, landowners, recreationists and many more. This organization has solicited enormous public involvement and is contributing greatly to the restoration of the Cheat River watershed.

DECKER'S CREEK

The Decker's Creek Watershed Association was formed in February of 1995. The association's mailing list is about 250 and there are 75 dues paying members. The Decker's Creek watershed covers 68 square miles in Preston and Monongalia counties. Its problems include industrial pollution, AMD, sewage, and run-off from timbering. This watershed association is working on a strategic plan to address these problems. To solve the problems of Decker's Creek, the owners of the Sterling Faucet industrial site, Greer Limestone, the local utility boards, and even the city of Morgantown will have to make changes in their activities to solve sewage and industrial pollution. AMD results primarily from abandoned coal mines, so the state government will have to play an active role in solving this problem.

Because the water and sewer utility boards have refused to even meet with Decker's Creek Watershed Association, members are moving toward legal solutions rather than compromise, discussion, and group activities. Partners of this organization include local businesses (which are not the source of pollution), civic organizations, environmental groups, and other watershed organizations like the Downstream Alliance. This is an active grassroots organization that holds regular meetings, puts out a newsletter, and engages in many different activities. These

activities include: Adopt-a-Highway projects every year, 15 illegal dump cleanups, part of litigation over management of the Tibbs Run watershed, and taking action to force compliance with state and Federal regulations on water quality. This watershed association also is engaged in public awareness and education activities. Multiple funding sources have been acquired. They have received financial backing from coal mine owners, a Stream Partners grant, a Scenic By Ways grant, fund raising concerts, and received numerous donations from businesses in the area.

DUNKARD CREEK

The Dunkard Creek Watershed Association began in the Fall of 1995. This organization was one where the WVWAP provided active facilitation during the start-up phase. This organization started over local concerns about subsidence and siltation in Dunkard creek. Other problems in this watershed include inadequate sewage treatment, illegal garbage dumps, and AMD. Located along the Pennsylvania border in western Monongalia County, the area where this association operates is in both WV and PA. In its activities, this association has involved the Natural Resources Conservation Service (NRCS), the EPA, the Division of Mines, WV-DNR, the WVU extension agent, the county commission, local businesses, local recreation groups, and agricultural organizations (Farm Bureau and Livestock Association). Organizational activities have included conducting a fish stocking in coordination with a local ramp⁴ festival, a litter cleanup of Dunkard Creek, construction of a stream access site, and working with state agencies in both WV and PA to conduct a water quality assessment of Dunkard Creek. Funds have been obtained through the Stream Partners grant and by the sale of raffle tickets.

HUGHES RIVER

The Cairo Community Development Association was formed in 1988 as an organiza-

tion of local governments. It has 25 members on a mailing list, 10 to 12 of which are active and participate in decision making. The area of concern is Ritchie County, and in particular Cairo. The primary problem on the North Fork of the Hughes River is the water flow. There is insufficient water in the summer and flooding during other months. The stream bank has eroded and the channel needs to be deepened. Flooding, erosion, and lack of constant water supply has led to a decline in property values in this area. Although the entire community, including all county and city government entities, is working together, so far there has been no participation from state or federal groups. This development association is seeking to have a dam constructed by the NRCS on the North Fork Hughes River to control water flow and develop recreational opportunities. The development association holds Pioneer Day and Community Dinner activities for fund raising (about \$1000 annually). The development association has received a \$10,000 Benedum grant to build a playground, but this was not really associated with its watershed activities. The development association did bring together citizens of the community to build a sandbag dam in order to acquire a source of water last summer. However, there are currently no plans for more community participation activities.

MONONGALIA AND PRESTON COUNTY WATERSHEDS

The Downstream Alliance was formed in 1991. This organization consists of a number of small watershed associations or people from different watersheds who did not have sufficient manpower to accomplish their goals on their own. There are six separate groups within the alliance, and six to twelve people generally participate in alliance activities. The alliance includes all of Monongalia and Preston Counties and parts of Taylor and Marion. There exists a wide range of water problems, including AMD, runoff from timbering, inadequate waste water treatment, and siltation from development and agriculture. The Alliance has decided to focus its attention on AMD.

The alliance members consider themselves to be an environmental coalition dedicated to water quality issues. Their primary activities have been water quality monitoring of streams and educational work through the development of a water quality map for Preston County. They hold workshops on water quality monitoring, and they have produced a handbook on water monitoring, a video on AMD, and a full color poster showing water quality. They do not conduct fund-raising other than the sale of the video, handbook, and poster. They have received a Stream Partners grant and grants from Finlandia Clean Water Fund and Canaan Valley Institute to support their water monitoring and materials production activities.

SHAVERS FORK

The Shavers Fork Coalition was formed the Summer of 1996 with facilitation assistance from the WVWAP and a Stream Partners grant. Flooding and sedimentation concerns exist on the Shavers Fork which flows through Randolph and Tucker Counties. The Shavers Fork Coalition has involved the U.S. Forest Service, the NRCS, the WV Division of Forestry, Randolph County government agencies, environmental groups, and Davis & Elkins College as partners in their activities. The Coalition has conducted three trash cleanups along the river; hosted a "stream behavior" seminar; assisted in gauge maintenance for the county flood warning system; sponsored flood related research at Davis & Elkins College; and has developed materials to conduct educational programs about the Shavers Fork Watershed in the community.

TIBBS RUN

The Tibbs Run Coalition was formed in October of 1995 to address a single issue - the proposed timbering of the Tibbs Run Reservoir area near Morgantown in Monongalia County. This property is owned by the Morgantown Utility Board. This coalition has prepared a management plan for the property and presented this plan to the Morgantown City Council. Because Tibbs Run is a tributary of Decker's Creek, the group

received assistance from the Decker's Creek Watershed Association. It never received or applied for grants, but did receive donations from individuals and in-kind assistance from other groups. Currently, the coalition is inactive, having achieved its initial goal -halting timbering and coming up with an alternative land use plan. Many coalition members also belong to the Decker's Creek Watershed Association and to Downstream Alliance, so they remain active on watershed issues.

WEST FORK RIVER

The Lower West Fork Watershed Association operates in Marion and Harrison Counties. Problems on the West Fork include water quality, AMD, and flooding damage. The main activity of this organization thus far has been litter cleanups. The Stream Partners program has provided a grant to improve and cleanup the watershed area. This organization formed in April of 1997 and has gained public support with newspaper articles, public meetings, and general word of mouth. Partners have included the EPA, West Virginia Department of Highways (WV-DOH), WV-DEP, WV-DNR, NRCS, the city of Worthington, the Worthington Volunteer Fire Department, Marion County Parks and Recreation, Save Our Streams Programs, landowners and recreationists.

The Marion County Parks and Recreation Commission is another organization which has addressed watershed issues along the West Fork in Marion and Harrison Counties, primarily recreational access. Watershed activities of the Commission have been conducted since 1996 in conjunction with the Rail Trail Project. A large grant was received from the Department of Transportation to develop a trail along the West Fork River. This group meets monthly and implements small projects, such as decking a bridge, along the 16-mile trail. Members from the group also volunteer personal time, expertise, and labor to help with construction on the trail. Stakeholders include the U.S. Army Corp of Engineers, Department of Transportation,

local government, local banks, Browning-Ferris Industries, Chamber of Commerce, Rotary Club, Lions Club, 4-H, Scout clubs, landowners, and recreationists.

WHITE DAY CREEK

Located in Taylor, Monongalia, and Marion Counties, White Day Creek has water quality problems of sedimentation from roads and logging. The White Day Creek Watershed Association was formed in October 1995 with assistance from the WVWAP. Organizational partners to this watershed association have included the U.S. Forest Service, state agencies (Forestry, WV-DOH, WV-DEP, & WV-DNR), civic organizations, and Trout Unlimited. This watershed association's activities have included production of a publication entitled *The History of White Day Creek*, which contains a written and pictorial history of the creek; two litter cleanups of the stream; and a tree planting to address sediment problems. This watershed association has received two grants thus far from the Stream Partners program to support its activities.

OHIO RIVER REGION:

MIDDLE ISLAND CREEK

The Middle Island Creek Conservation Group has attempted to obtain the resources necessary to remove debris and to improve the river flow within a jug handle⁵ area of Middle Island Creek. This project was designed to enhance recreation and tourism use of Middle Island Creek. This group has not been successful to date in two attempts to obtain a Stream Partners grant despite pledging a two-to-one matching of resources. This group has involved Tyler County government organizations such as the County Commission, extension agent, and Economic Development Office. Because the Stream Partners grant has not been obtained, the Middle Island Creek Conservation Group is not an active organization.

OHIO RIVER

The Wheeling Environmental Conservation Association was organized in 1993 to improve the environmental quality of life in Wheeling, WV. This organization received a Stream Partners grant in 1996. Its efforts related to watershed organizations have included organizing two public meetings to solicit opinions and views about the Ohio River from residents of Wheeling and Ohio County and to present watershed research being conducted at Wheeling Jesuit University. No watershed organization was ever formed from these efforts. A lack of volunteer effort in the community and a "what can the government do for us" attitude were cited as reasons for no organization being formed.

SOUTHERN REGION:

BLUESTONE RIVER

The Bluestone Environmental Restoration Project was formed in 1991. This group formed as a spin-off from the Mercer County Environmental Restoration Project which has undertaken the cleanup of the Bluestone River. This group is concerned with all of Mercer County, although the Bluestone River is the primary focus. The problems are industrial and sewage discharges into the Bluestone River. Since sewage is the biggest problem, group activities involve work with the health department and WV-DNR. To date, the group has not conducted any watershed projects, although it did receive a Stream Partners grant. It has held no fund-raisers and has not even engaged in educational activities.

DAVIS CREEK

Davis Creek is located south of Charleston, WV. The Davis Creek Watershed Association began June of 1995 over concerns about the extension of a City of Charleston sewer line along the creek. Construction of this sewer line damaged wildlife habitat for about two miles. With facilitation assistance from the WVWAP, this watershed association formed to address the

damage created by this sewer line and problems of litter/illegal dumps along the creek, and sedimentation problems from land management practices along the creek and an upstream dam located in the Kanawha State Forest. This watershed association has developed organizational partnerships with the U.S. Geological Service, the Kanawha State Forest, WV-DEP, WV-DNR, environmental groups, local businesses and civic organizations, and other watershed organizations. Organizational activities have included numerous litter cleanups along the stream, a stream restoration project along the two miles of stream damaged by the sewer line to create water flow and deepen pools, and workshops for training of water quality monitors and conducting of monitoring along the stream. This organization is unique because it is monitoring water quality at sites upstream and downstream from the restoration project to assess its impact on the stream. The Davis Creek Watershed Association has received financial assistance from a Stream Partners grant and a fund-raising letter to watershed residents. Numerous businesses and organizations have contributed resources (labor, equipment, water testing, etc.) towards the activities of the association.

ELKHORN RIVER

The Elk River Development Corporation operates in Clay, Braxton, and Upper Kanawha Counties, including the Elk River Valley between Clendenin and Clay. This development corporation was formed in 1992 with the purpose of making the watershed area attractive, especially sites bordering the river, in order to improve economic and recreational aspects of the community. Stakeholders include the WV-DNR, WV Department of Culture and History, Clay County Commission, Clay County Historical Society, Lions Club, Governor's Summer Youth Program, Small Business Development Center and landowners. This group has received one grant from the Department of Culture and History to restore a courthouse located directly next to the Elk

River. With local media attention and grant funds, this group is working on restoring the courthouse to bring visitors to the watershed area, create business for local merchants and gain public attention for Elk River and Clay. Currently, this organization meets infrequently with no pending projects.

GREENBRIER RIVER

The Greenbrier River, which flows through Pocahontas, Greenbrier, Monroe, and Summers Counties, is the geographic area for the Greenbrier Watershed Association. This association was formed in 1991. Pollutants from local tannery sites, non-point pollution from fertilizer runoff and septic tanks, and the absence of sewage treatment are problems in this watershed area. Annual river cleanups of litter and educational workshops for schoolchildren and the general public are activities undertaken by this watershed association. Stakeholders include the NRCS, local water and sewer utility departments, Elk River Touring Center, Lewisburg Insurance, Concerned Citizens of Alderson Glenray, Friends of Greenbrier, Sierra Club, Farm Bureau, Rotary Club, Camp Allegheny, landowners and recreationists. Grants from Canaan Valley Institute, the Stream Partners Program, REI, and WV Rivers Coalition have been used for public outreach and educational efforts. Funds raised by wine tasting, art shows, music festivals, and auctions have been used to implement litter cleanups and to print informative newsletters and brochures.

INDIAN CREEK

The Indian Creek Watershed Association was formed in February of 1996. This association covers Indian Creek and all of its tributaries in Monroe and Summers counties. Indian Creek problems include agricultural activities, such as fertilizer runoff and attempts to change stream directions by individual farmers, inadequate sewage treatment which allows sewage into the watershed, and a general lack of public awareness about water issues. There are 21

members on a mailing list; about a dozen are active. No organizational partners are formally represented in this association; although, the present leader of the group is an employee of the WV-DEP. Farmers who are not responsible for the problems, small business owners, and environmentalists also belong as individuals. The association would like to have representation from the Farm Bureau, local governments, and state government agencies but have been unable to get them to formally participate. Although they have given speeches to schools, 4-H meetings, and other activities, and had a display at the State Fair, they feel frustrated by the lack of attention they are receiving. This association has received a Stream Partners grant to help restore a covered bridge and the surrounding stream bank. It has held no fund-raising activities, and has no activities currently planned.

LOWER PAINT CREEK

The Lower Paint Creek Association, Inc. was formed in June of 1995 with facilitation assistance of the WVVAP. This association currently has 775 people on a mailing list, and sometimes has as many as 100 people attending its meetings. The area of operation is Raleigh, Fayette and Kanawha Counties, with the area between Pratt and Hansford being the main area. The association addresses a wide variety of water quality problems including illegal discharges from strip mines and oil gas wells, stream siltation, erosion from timbering, AMD, illegal dumping, and stream habitat improvement. Participation in this association has come from the Office of Surface Mining, many local governments, businesses and civic groups, WV-DEP, WV-DNR, WV Department of Forestry, Department of Highways, American Electric Power, Cyprus Amax Coal Company, the Canaan Valley Institute, and the Izakk Walton League. The association does not conduct fund raising, but uses membership dues to finance flyers, ads in local newspapers and school catalogs. The association has received two Stream

Partners grants and one grant from the Kanawha County Commission. These grants were used to build a fishing pier, and they are now engaged in fish restocking activities. The association also has sent letters to companies or people who are illegally discharging into the watershed, and members work with state agencies to get enforcement. The members feel they have been very successful by using public education activities and working with appropriate agencies to obtain compliance with existing regulations.

MUD RIVER

The Lincoln County Development Authority was organized in 1969. Its geographic area of operation is all of Lincoln County. Problems of the Mud River include flooding, erosion, and a lack of outdoor recreational facilities. The Authority tries to address all of these problems. Its primary objective is to get a flood control dam built on the Mud River, which would also provide recreational opportunities. About forty homes and 1800 acres would be destroyed by the dam, so there is some opposition to the project from these landowners. The authority replaced two watershed associations (Mud River and Friends of the Mud River) which attempted to get started in the Mud River Watershed. Since it is a development authority, its focus is on development rather than strictly watershed issues. There are twelve active members (all volunteers) who all participate in decision making, and no additional members or mailing list. The authority has received no assistance from the WVVAP or the Stream Partners Program, mostly because its focus is on one large project rather than small community watershed issues. The NRCS, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service are involved in helping with the flood control dam project, as are the state agencies of WV-DEP, WV-DNR, WV Soil Conservation Service, Department of Highways, and Region II Planning and Development. The Authority has received \$750,000 in grants to fund this project and has

engaged in several public awareness activities using television and print media. There are no activities other than this flood control dam and development of recreational activities.

MONCOVE LAKE

Moncove Lake is located in Monroe County. The Moncove Lake Foundation was formed in 1990 to address problems of water quality (low ph), low water levels throughout the summer season, a lack of trout in an adjoining stream, and littering. Stream litter cleanups and annual stocking of trout are organized and implemented by this group. A grant from the Stream Partners program has provided funds for public educational purposes, a stream cleanup, and stocking of trout. Stakeholders include WV-DNR, Monroe County government, Westvaco Corporation, Farm Bureau, Lions Club, Ruritan Club, Trout Unlimited, 4-H, Cub Scouts, landowners, local businesses, and recreationists. This group solicits help from the close-knit community by sponsoring Kids Fishing Derby Days and an annual Summer Festival. Stream rehabilitation, such as correcting low ph and water levels, is the focus of current group efforts to generate public awareness and interest through newspaper advertising and word of mouth.

TUG RIVER

The Tug River flows over 100 miles through three states (VA, WV, and KY). Flooding and litter from illegal garbage disposal are the primary watershed concerns. Within the city of Matewan, the flooding problem has been addressed with the construction of a re-enforced stream bank and flood wall by the U.S. Army Corp of Engineers. In addition, the National Park Service and the Corp developed a Tug Valley Riverway Master Plan for recreational use of the river. Watershed association activity along the Tug River stemmed from the community input meetings which were held to develop this master plan. The Matawan Development Center received a Stream Partners grant to coordinate the formation of watershed associa-

tions along the Tug River. Starting with contacts from the community meetings, additional public meetings were held to organize watershed associations within three sections of the Tug River: Upper, Middle, and Lower. The Elkhorn Creek Watershed Association on the upper part of the Tug River is the only association that came together and formed in March of 1996 with assistance from the Matawan Development Center and WWAP. The Matawan Development Center did provide financial support from the Stream Partners grant to Herley Community Group in Virginia, which was involved in a stream cleanup along the Knox Creek in Virginia (a tributary of the Tug River).

Elkhorn Creek is located in the eastern half of McDowell County, beginning at the Mercer County line and continuing through Northfork, Keystone, and Kimball into Welch. Littering in the stream, raw sewage running into the stream, no public access, and little public awareness are problems which this association addresses. The Elkhorn Creek Watershed Association has implemented litter cleanups of Elkhorn Creek, development of recreational access sites, educational workshops, and media attention to benefit the watershed. In addition to the Matawan Development Center, this watershed association has received financial and resource assistance from the Stream Partners Program, Appalachian Regional Commission (ARC), McDowell Board of Parks and Recreation, Kimball Light & Power, Bank of Keystone, Two Rivers Conservation Club, Northfork Volunteer Fire Department, landowners, recreationists, and numerous other groups.

WHITE SULFUR SPRINGS

White Sulphur Springs was formed in 1996 to address concerns about a channelization project implemented by NRCS on Howard's Creek adjacent to the downtown area of White Sulphur Springs. This organization is affiliated with another local organization, Main Street White Sulphur Springs. The channelization project removed all vegetation along the stream

bank, creating a sterile environment detrimental to fish habitat. This organization is currently inactive because no cooperation has been received from the NRCS and no grants have been acquired. There have been no activities or fund raising although group members are trying to convince the NRCS to expend funds to landscape the area.

EASTERN PANHANDLE REGION:

BACK CREEK

Back Creek runs the length of Berkeley County from the Virginia state line to the Potomac River. This geographic area is where the Blue Heron Environmental Network, Inc. operates. This organization was formed in April of 1991 and works to prevent the degradation of water quality in Back Creek by taking measures to restore the stream and its buffer zone. Sloppy construction of housing developments in this area results in stream damage by discharges of septic drainage, silt and sediment problems, and disappearance of buffer zones. Blue Heron works with partners such as the EPA, WV Soil Conservation Service, WV-DNR Wildlife Endangered Species Protection, the Izaak Walton League of America, Back Creek 2000 Program, B.A.S.S. Masters, REI., landowners, and recreationists to implement projects to insure a healthier watershed. The Blue Heron Blues Festival is an example of its fund-raising activities. This group has obtained grants from the Potomac Headwaters Resource Conservation District, the WV Soil Conservation Service, Coors Brewing Company, and REI Recreational Equipment Inc. Blue Heron works closely with the community by sponsoring educational workshops and stream litter cleanups.

BAKER'S RUN

Baker's Run Watershed Conservation Society was formed in January 1994 with encouragement from the WWAP. This organization operates around Baker in Hardy County. Education projects and stream litter cleanups by

this organization inform the community of pollution and development in its watershed area. Non-point pollution problems in Baker's Run stem from poultry farming and illegal trash disposal. A highway development project (Corridor H) also is slated to run through the watershed. The WV Soil Conservation Service, Project WILD, OWLS Project, EPA, Youth Conservation group, Scout groups, landowners, schools, the Ruritan Club, and recreationists are participants in Baker's Run's education and cleanup projects. With grants from OWLS Project, WILD Project, Wellness Program in Hardy County, and the WV Soil Conservation Service, this group organizes educational sessions for school children and various other community members. The Baker's Run Watershed Conservation Society hosts annual stream litter cleanups, stream monitoring, and tree plantings.

LOST/ CACAPON / NORTH RIVERS

These rivers are located in Hardy, Hampshire, and Morgan Counties. The Pine Cabin Run Ecological Laboratory is located in this watershed. This organization has existed since 1985 and its mission is to use science and education to help concerned citizens enjoy and protect Appalachian Rivers. The lab has conducted baseline studies of river ecosystems for the Cacapon and Greenbrier Rivers. Public education activities include organizing an annual Riverfest and conducting educational float trips down the Cacapon and Lost Rivers. The Lab has received two Stream Partners grants. One of these grants is being used to initiate a Riparian Friendly Beef Marketing program on the watershed. The plan for this program is that beef from livestock producers who conduct land management practices which protect riparian habitats will be certified as Riparian Friendly and directly marketed to downstream consumers at a premium. The lab is currently attempting to form a watershed association in this area which would operate separately from the lab.

NEW CREEK

The New Creek Valley Watershed Association started in February of 1996. Three floods along the New Creek within a 15-month span during 1994 and 1995 triggered public concerns over long standing flooding problems related to residential and commercial development along the New Creek. The WVVAP assisted in the initial formation and meetings of this association, but has otherwise taken a mainly consultation role. Located in Mineral County, this watershed association is focused within the city of Keyser and the unincorporated area surrounding the New Creek. This watershed association has members from the county commission, Keyser city council, Region 8 planning commission, and the Potomac Valley Soil Conservation District. The main accomplishment of this association to date has been securing of \$175,000 in funding from the state legislature for the WV Soil Conservation Agency to clean out bottlenecks in the creek and re-enforce the stream bank with rock baskets. This organization also has conducted a litter cleanup along the stream, secured a commitment from the city of Keyser for water testing of the stream, and has received a small grant from the Canaan Valley Institute to install a mini-weather station for 24-hour monitoring of weather. Keyser High School is cooperating in operation and data collection from the mini weather station.

THORN CREEK

Thorn Creek is located in Pendleton County. Concerns of local residents include flooding and storm water management. The Thorn Creek Watershed Association was formed during the fall of 1996 and has held two public meetings to address these concerns. The organizing committee for this watershed association included representatives of farmers, recreationists, environmental groups, and the county health department. This organization received a Stream Partners grant in 1996 to restore a wetlands

located on property owned by a non-profit educational organization called the Lightstone Foundation.

TROUT RUN

Friends of Spring Run's Wild Trout was formed in February of 1996 and operates in Grant and Hardy Counties. Problems on Trout Run which are addressed by this group include flood damage to streambanks and trout habitat, poaching in catch-and-release fly fishing, roadside litter, and potential for future flood damage. The group combats these problems with trout habitat improvements, stream cleanups and restoration, and by offering a mandatory no-cost permit to fish in the Spring Run's area. The fishing permit helps decrease poaching and littering in Spring Run. There are numerous stakeholders including U.S. Forest Service, Spring Run Trout Hatchery, conservation officers from the WV-DNR, WV-DEP, Grant County Department of Highways, Petersburg Recycling Program, Trout Unlimited, Ruritan Club, Lions Club, small business owners, landowners and recreationists, especially fly fishers. A grant was obtained from the Stream Partners Program for flood damage repair, stream bank stabilization, and trout habitat improvements. Many donations from businesses, non-profit organizations and individuals have helped Spring's Run transform into a beautiful trout stream and fishing area.

UPPER SOUTH BRANCH OF THE POTOMAC

The Upper South Branch Watershed Association began in June of 1996. The WVVAP provided facilitation assistance for the initial meeting of this association. The upper portion of the South Branch of the Potomac is located in Grant, Hardy, and Pendleton Counties. In this watershed as well as downstream into the Potomac River and Chesapeake Bay, there is a lot of concern about nitrogen and phosphorus nutrient loads. Fecal

coliform problems also have been found along the South Branch. These water quality concerns have been connected to the expanding poultry industry in this part of West Virginia. However, baseline data does not exist to support these water quality concerns. To address uncertainties in the data available, this watershed association established a committee to review the available water quality studies to determine whether the data conclude that there is a water quality problem in the Upper South Branch Watershed.

This review committee had members from federal and state governments, private industry, and agricultural landowners. This committee recommended that the Upper South Branch Watershed Association should not hire a consultant to review the data, but rather should use its resources to promote watershed education and monitoring. Public education programs are being planned by this watershed association with the financial assistance received from two Stream Partner grants. The WV Department of Agriculture is currently conducting water quality monitoring on the South Branch.

Appendix C

Variable Data Used in the Analysis

CODE NUMBER	APPROX. POPULATION (000)	ACTIVE YES=1 NO=2	WWWAP	STREAM	TOTAL MEMBERS MAILING	TOTAL PARTIC ACTIVITIES	PARTNERS TOTAL NUMBER
1	32.5	1	1	1	200	40	15
2	9.8	0	0	0	10	5	6
3	20	1	1	1	50	20	10
4	29.5	1	1	1	75	40	7
5	5.9	1	1	1	32	15	10
6	3	1	1	1	100	30	21
7	19.5	1	1	1	1000	25	20
8	34.9	0	0	1	100	7	3
9	0.2	1	0	1	N/A	N/A	4
10	3.7	1	1	1	25	5	11
11	39.6	1	0	1	3200	16	10
12	13.5	1	0	0	142	25	11
13	10.2	1	0	0	25	12	10
14	21.4	1	0	0	12	12	18
15	80	1	1	1	775	75	33
16	65	1	1	1	10	8	3
17	104.5	1	0	1	6	15	6
18	25.9	0	0	0	50	12	7
19	9.7	1	0	1	21	12	5
20	57.6	1	0	1	250	17	13
21	1.5	1	0	0	N/A	15	13
22	23	0	0	0	37	8	1
23	57.2	1	0	1	11	11	17
24	29.9	1	0	0	40	15	15
25	11.9	1	1	1	36	12	12
26	0.15	1	1	1	10	10	9
27	86.6	1	1	1	150	6	49
28	2.8	0	0	0	6	4	3
29	69.4	1	0	1	30	18	11
30	47.3	1	1	1	250	20	10
31	10.4	1	0	1	7	7	25
32	7.1	0	1	1	0	0	1

CODE NUMBER	LOCAL GOVT.	STATE GOVT.	PARTNER TYPES			LAND OWNERS	RECREATION
			FED. GOVT.	BUS. & INDUSTRY	ENVIR.		
1	4	2	2	2	3	0	0
2	4	0	1	1	0	0	0
3	0	5	1	0	1	1	0
4	0	3	1	3	0	0	0
5	4	3	0	0	0	1	0
6	1	3	1	9	4	0	0
7	5	3	3	4	0	1	2
8	0	1	1	0	0	0	0
9	0	2	0	1	0	0	0
10	4	1	1	0	1	1	1
11	2	1	1	0	3	1	0
12	1	2	1	3	2	1	1
13	10	0	0	0	0	0	0
14	5	4	3	3	0	1	1
15	4	2	1	24	2	0	0
16	1	1	0	0	1	0	0
17	0	0	0	0	6	0	0
18	3	1	0	0	2	1	0
19	0	2	1	0	1	1	0
20	0	1	2	2	6	0	1
21	1	3	0	3	0	1	1
22	1	0	0	0	0	0	0
23	3	1	2	3	0	1	1
24	4	2	3	4	0	0	0
25	2	2	1	3	1	1	0
26	0	3	2	0	0	0	0
27	1	2	4	30	3	0	5
28	1	0	1	1	0	0	0
29	3	3	4	0	1	0	0
30	1	1	1	1	4	0	1
31	2	3	1	14	1	1	0
32	0	0	0	0	0	0	0

CODE NUMBER	OTHER NON-PROFIT	LEADER OPINION INCLUSIVE	EXTERNAL RESOURCES ACQUIRED (\$)	TOTAL OUTSIDE COMMUNITY (\$)	TOTAL WITHIN COMMUNITY (\$)	NUMBER OF FUNDING SOURCES	NUMBER OF # DISTRICT ACTIVITIES
1	2	4	15200	15200	0	3	4
2	0	6	0	0	0	0	0
3	2	4	10000	10000	0	1	4
4	0	5	10000	10000	0	1	1
5	2	7	181500	180500	1000	4	4
6	3	5	5300	5000	300	2	4
7	2	4	8000	5000	3000	2	3
8	1	N/A	5000	5000	0	1	0
9	1	N/A	3300	3300	0	1	1
10	2	N/A	5000	5000	0	1	1
11	2	N/A	58400	10000	48400	5	3
12	0	5	10000	7500	2500	5	2
13	0	4	13000	10000	3000	4	2
14	1	6	750000	750000	0	2	1
15	0	7	341000	341000	0	4	9
16	0	2	5000	5000	0	1	0
17	0	1	10000	7500	2500	10	2
18	0	5	3800	0	3800	3	1
19	0	3	5000	5000	0	1	0
20	1	3	100000	66000	34000	8	5
21	4	2	14300	11000	3300	4	3
22	0	6	0	0	0	0	0
23	0	4	70000	60000	10000	3	1
24	1	6	51000	10000	41000	3	3
25	2	4	57000	56300	700	5	3
26	4	6	60000	6000	0	5	4
27	4	3	673000	419000	254000	10	6
28	0	4	N/A	N/A	0	1	1
29	0	6	5000	5000	0	1	1
30	1	4	21000	12500	8600	8	5
31	3	4	12000	5000	7000	2	1
32	1	N/A	1000	1000	0	1	0

CODE NUMBER	UNDER \$1,000	\$1,000 - \$5,000	\$5,000 - \$20,000	\$20,000 - \$100,000	OVER \$100,000
1	2	1	1	0	0
2	0	0	0	0	0
3	1	2	1	0	0
4	0	1	0	0	0
5	1	2	0	0	1
6	0	2	2	0	0
7	0	1	1	1	0
8	0	0	0	0	0
9	0	0	1	0	0
10	0	0	1	0	0
11	0	1	1	1	0
12	0	2	0	0	0
13	0	2	0	0	0
14	0	0	0	1	1
15	1	5	1	0	2
16	0	0	0	0	0
17	0	0	2	0	0
18	0	1	0	0	0
19	0	0	0	0	0
20	1	3	1	1	0
21	1	2	0	0	0
22	0	0	0	0	0
23	0	0	0	1	0
24	2	0	1	0	0
25	0	2	0	1	0
26	3	1	0	0	0
27	1	1	1	2	2
28	0	0	1	0	0
29	0	1	0	0	0
30	0	2	2	1	0
31	0	0	0	1	0
32	0	0	0	0	0

ENDNOTES

- 1 A partner is defined as any institution or group (private, government or non-profit) which assists the watershed organization in achieving its mission. Partners provide resource assistance (financial or in-kind) in the activities undertaken by the watershed organization and/or partners are represented in the watershed organization and contribute to organizational decision-making.
- 2 Since landowners often did not have a representative organization and many individuals are landowners, this category was treated as a 0/1 category, either the watershed organization actively pursued and acquired landowner input or it did not.
- 3 Entrance criteria was probability of F \leq 0.05 and probability of F to remove \geq 0.10.
- 4 An onion-like plant which is harvested in the springtime. Many areas around West Virginia hold festivals featuring food dishes using this plant.
- 5 Middle Island Creek comes within 50 feet of reconnecting with itself in a shape like a jug handle. The six-mile stretch of creek which forms the jug handle is ideal for recreational canoeing because boaters can put in and come out at the same spot.

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