

Final Report

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Upper Delaware Common Waters Booklet

Project Outcome Highlights

The broad purposes of this grant/partnership were three-fold:

- 1) Demonstrate the benefits to NRCS CIG of the “Grants Leveraging Funds” category;
- 2) Fund pilot projects to test the opportunity to develop sustainable funding streams, or payment for watershed services, for protection of forested watersheds. In general, watershed protection results in cleaner water, which is less expensive to treat and store. Expenditures for watershed protection tend to be more cost effective than simply building new treatment and storage facilities. Thus, there is a compelling economic argument for watershed protection, in addition to all the other natural resource benefits, such as wildlife habitat, carbon sequestration, and recreation land; and
- 3) Create sustainable funding streams from water consumers that can be used to protect watersheds over the long-term and at a scale far-beyond what any single agency or foundation can do. In this project, the Raleigh watershed succeeded, creating a watershed protection fee with minimal impact on water consumers that generates nearly \$2 million annually for watershed conservation purposes.

Grants Leveraging Funds

The \$2 million award from NRCS CIG was matched with \$2 million in cash from the Endowment to create a \$4 million grant pool. The Endowment, in partnership with NRCS, developed a “Request for Proposals” and managed all aspects of grant administration, saving NRCS considerable administrative costs. The Endowment’s leadership in managing the RFP process ensured that key potential applicants within the water conservation community were targeted in the competition. The Endowment strongly supports the Grants Leveraging Funds approach for:

- Securing non-federal match for NRCS funds, thus substantially “growing” NRCS funds prior to deployment on the ground;
- Targeting specialized partners for specific NRCS priorities, who might not typically respond to the broad, CIG call for proposals;
- Engaging “non-traditional” partners, such as the forest and watershed management communities, in the CIG program;
- Reducing NRCS administrative burdens in the grants management process;
- Allowing much more active management of the project that NRCS might otherwise be able to do, given staff limitations; and
- Enhancing communication among project partners so they may benefit in real time from each other’s accomplishments, and improving communication to the outside world on a continuous basis, rather than waiting for final reports to be completed. Again, this is a function of the Endowment, as project manager, to invest more time in communication than NRCS could, due to other priorities and staff limitations.

Payment for Watershed Service Pilot Projects

Three pilot projects were funded as a result of the competition managed by the Endowment:

- The Upper Delaware River Watershed of New York, New Jersey, and Pennsylvania;

- The South Fork Rivanna Watershed of the Charlottesville, Virginia, area; and
- The Upper Neuse Watershed of the Raleigh, North Carolina area.

The grantee working in the Upper Neuse Watershed of North Carolina was successful in establishing a payment for watershed services programs. Through a watershed protection fee initiated in 2011, Raleigh residents pay on average about 40 cents/month, generating nearly \$2 million annually for watershed conservation.

Although the other two grantees were not successful in establishing a payment for watershed services-type program, the campaign to establish such a structure in these two areas continues and may be realized in the future. The Endowment continues to be involved in both areas.

In addition, watershed protection practices such as Forest Stewardship Plans, EQUIP projects, and conservation easements were established on more than 66,000 acres in the three watersheds.

One important outcome of this project is that the land trusts and conservation groups that received funding through this partnership became much more fully engaged with NRCS State and District Conservation Offices. This improved the quality of the results for these specific projects and also created alliances that will continue long after the grant funds have been expended. We also believe that NRCS benefitted by being exposed to partners with strong forest and watershed expertise.

Sustainability of Watershed Protection Funding Sources

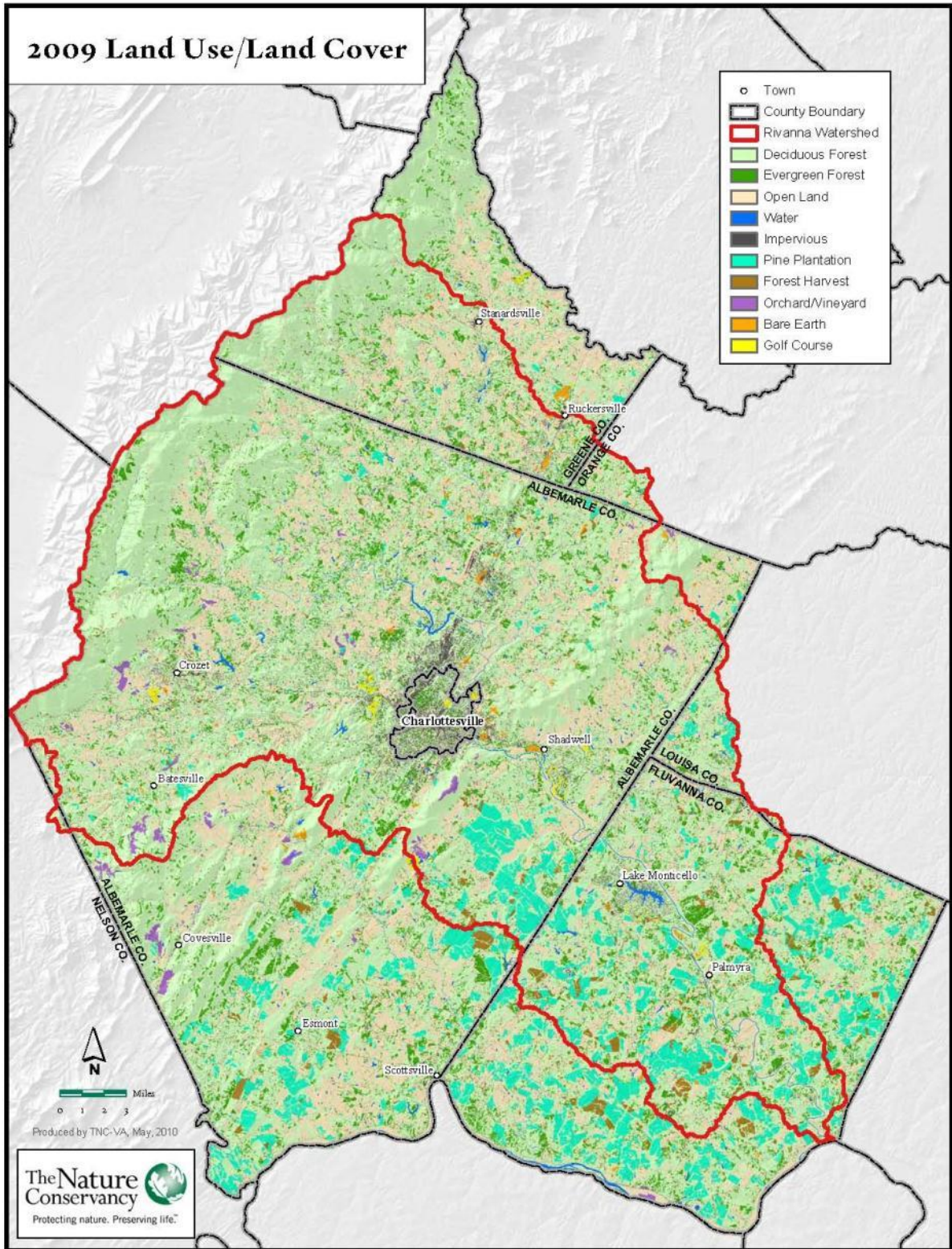
It can't be overemphasized that this NRCS project resulted in a long-term funding source for watershed protection in the Raleigh, North Carolina watershed. NRCS invested \$850,000 in this project, matched by \$850,000 from the Endowment. The immediate benefits from this investment were 6,033 acres and at least 32.7 stream miles improved through Conservation Practices, including 5,412 acres of Forest Stewardship Plans, 856 acres of EQUIP projects, and 688 acres of working forest easements.

The much more significant benefit is that Raleigh tapped its citizens to make modest (40 cents) monthly payments on their water bills that are now devoted to watershed protection. This means that each year, nearly \$2 million is generated for watershed conservation, providing true sustainability for this effort.

Following are brief summaries of each of the three pilot projects:

1) **South Fork Rivanna Watershed, Virginia**

\$400,000 grant (\$200,000 NRCS; \$200,000 Endowment) grant to Virginia Department of Forestry.
Match raised by grantee: \$233,000.

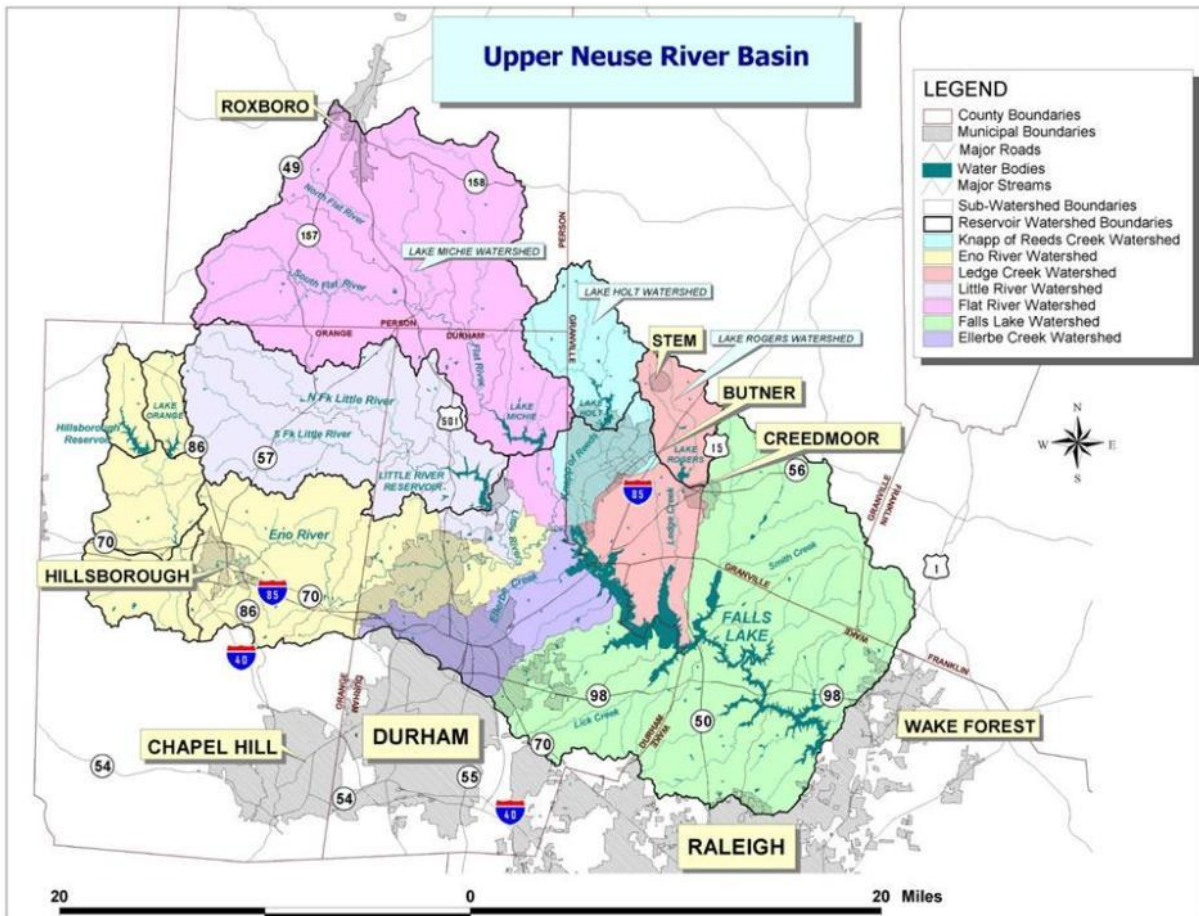


Key Outcomes:

- 8,126 acres improved through conservation practices, including 6,700 acres of Forest Stewardship Management Plans and 1,282 acres of conservation easements.
- An Optimum Infrastructure Expenditure Model (Model) was developed to help determine the optimum mix of green and gray (built) infrastructure. This model includes factors such as nitrogen and sediment reduction. The model was designed for water supply utility and local government watershed managers to optimize annual expenditures for afforestation, forest conservation easements, and dredging. Important results from the model include:
 - Over a 30 year planning horizon, afforestation in the South Fork Rivanna River Reservoir Watershed has a similar impact on reservoir life as does dredging for approximately the same expenditures. Afforestation provides many ancillary benefits that dredging does not, such as carbon sequestration, land for recreation, wildlife habitat, etc.
 - The lifetime cost effectiveness of afforestation as compared to dredging in the South Fork Rivanna River Reservoir Watershed ranges from approximately the same to significantly greater, due to sediment load reduction that continues beyond the planning horizon, depending upon the likelihood of afforestation reversion.
 - Forest conservation easements have a high lifetime cost effectiveness to mitigate future increases in sediment loading, when future forestland non-conversion is certain.
 - A combination of expenditures for afforestation, easements, and dredging maximizes the South Fork Rivanna River Reservoir life.
- Advocacy for Charlottesville and Albemarle County to study the use of a portion of the water base rate for Green Infrastructure was underway during the final months of this project. Just prior to completion of this Final Report, the Albemarle County Board of Supervisors requested staff preparation of a study proposal for Green and Grey Infrastructure Optimization suggesting that long-term funding/sustainability may still result from this project.

2) Upper Neuse Watershed, North Carolina

\$1,700,000 grant (\$850,000 NRCS; \$850,000 Endowment) to Conservation Trust for North Carolina. Match raised by grantee: \$3,181,000.

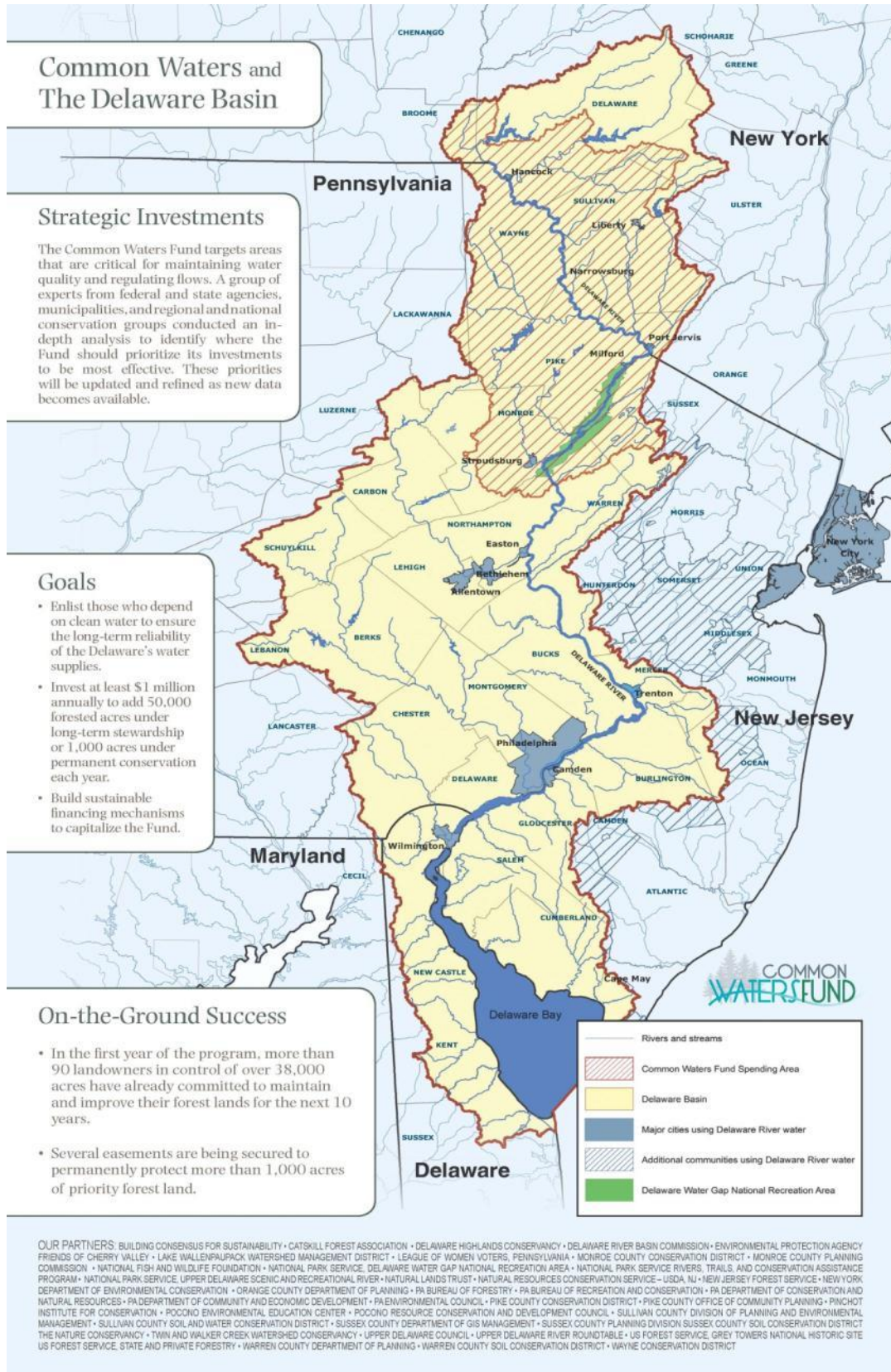


Key Outcomes:

- 6,033 acres and at least 32.7 stream miles improved through Conservation Practices, including 5,412 acres of Forest Stewardship Plans, 856 acres of EQUIP projects, and 688 acres of working forest easements.
- The City of Raleigh established a watershed protection fee of 1 cent/100 gallons on all municipal water users in the summer of 2011; this was a direct result of the NRCS/Endowment funded grant. The fee costs the average household only about 40¢/month, but generates around \$2 million/year for land acquisition and other water quality protection projects. The same year Durham passed a “penny per tier” rate increase on its water users. The rate increase generates around \$100,000/year for watershed protection in the Upper Neuse and Cape Fear River Basins. The Conservation Trust for North Carolina is also meeting with the Town of Cary and the Orange Water and Sewer Authority to encourage passage of similar watershed protection fees.

- A Watershed Health Index (WHI) was developed to prioritize landowners for participation in the Project, which ensured that time and resources were spent protecting the forestlands most critical to watershed health. The WHI informed strategic land conservation in the Upper Neuse, which allowed us to achieve water quality protection and other community and ecosystem benefits that accrue from forestland conservation.
- The Forest Landowner Outreach Program was very successful, with more than 1,000 priority forest landowners contacted; seven workshops were attended by more than 120 forest landowners. NRCS District Conservationists played a critical role in this aspect of the project. Many of the land trusts that participated in this project did not have experience reaching out to forest landowners to offer services such as Forest Stewardship Plans or EQUIP projects. The strong partnership that developed between District Conservationists and the land trusts helped overcome this deficiency, and also exposed the District Conservationists to the land trust community in a more fruitful way.
- Outreach to forest consulting firms was also a key to success for the land trusts. By focusing on the consultants, they gained access to the clients supported by those consultants, greatly leveraging the land trust's ability to reach target landowners.

- 3) **Upper Delaware River Watershed, Pennsylvania, New York, and New Jersey**
 \$1,900,000 grant (\$950,000 NRCS; \$950,000 Endowment) to Pinchot Institute for Conservation.
 Match raised by grantee: \$1,246,182.



Key Outcomes:

- 52,172 acres improved through Conservation Practices, including 39,853 acres of Forest Stewardship Plans, 10,890 acres of EQUIP projects, and 1,429 acres of working forest easements.
- Created the Common Waters partnership, which developed a common set of practice requirements for the 2.8 million acre region, which spans nine counties in three states. The size of the watershed demanded common metrics were for cross-boundary communication.
- Developed science-based, consensus priority maps for source water protection. These were used to determine funding eligibility and to rank proposals. The priorities illustrated by these maps should have enduring value for future watershed protection efforts.
- The Common Waters partnership was not successful in creating a sustainable funding source for watershed protection. They did, learn a lot about the barriers to creating such a fund for this watershed, which will help inform continued efforts. Barriers include:
 - Hundreds of drinking water purveyors among the four states and 840 municipalities experience different quality and flow situations and may be more or less insulated from influences in the headwaters.
 - Waste and stormwater concerns may surpass source water issues. For example, the Philadelphia Water Department must comply with regulations regarding stormwater; a recently enacted stormwater fee created an outcry, increasing the political difficulty of new fees for source water protection.
 - Purveyors are concerned about impacts of rate increases and spending decisions on economically disadvantaged communities.
 - There are few drinking water storage reservoirs in the basin, and most face few nonpoint pollution issues. Sedimentation and the resulting dredging costs are not major concerns for reservoir managers.
 - Water is withdrawn directly from the main stem of the river at many points, so each facility deals with different quality and quantity issues.
 - Few water bodies are impaired. There is no Total Maximum Daily Load (TMDL) or similar pollution goal requiring collective action.
 - There are no filtration avoidance decrees within the Basin; most water providers have sufficient treatment infrastructure in place.
 - Water scarcity is rarely an issue in the basin.
 - Catastrophic wildfire and resulting sedimentation/flooding is not an issue.
 - Measuring success and attributing actions to results will be difficult: the goal for the upper Delaware is to maintain existing water quality, so we hope for no changes rather than drastic improvements in indicators and there are many confounding factors beyond our control that could influence water quality in the main stem of the River.

Deliverables Identified on the Grant Agreement:

- Identification of workable/acceptable technologies, strategies and approaches that incent forest owners to retain working forests in part to meet ecological services outputs (water);
- Evaluation by practice of effectiveness in generating critical mass to achieve outcome;
- Methodologies that can be readily transferred to other watersheds across the nation; and

- Attend at least one NRCS CIG Showcase or comparable event during the period of the event.

Executive Summary

What NRCS designated priorities were met with this grant?

National Natural Resource Concerns

- Water Resources
- Forest Health
- Wildlife Habitat

National Technology Categories

- Water Management
- Improved Nutrient Management to Improve Water Quality

Grant Leveraging

What were the goals and objectives for this project?

The primary goals and accomplishments for this project were to:

- 1) **Goal:** Demonstrate that the CIG “grants leveraging funds” program could attract significant private sector investment for NRCS designated priorities; successfully design and implement a program using this approach.
Accomplishment: The Grants Leveraging Funds program worked very well. The NRCS investment of \$2 million was matched by \$2 million from the U.S. Endowment for Forestry and Communities. A Request for Proposals was distributed and three highly-qualified applicants were selected as subgrantees. The Endowment managed this process on behalf of NRCS, saving the agency considerable time and effort. The three grantees provided an additional \$4,660,000 in match, resulting in a total on-the-ground impact of \$8,660,000, not counting the additional \$2 million that is being invested *annually* in the Raleigh watershed.
- 2) **Goal:** Identify three watersheds to be funded as pilot projects, with each defining a process and strategy for developing a revenue stream for watershed conservation.
Accomplishment: The three watersheds chosen through a competitive process were the 1) Upper Delaware River, managed by the Pinchot Institute for Conservation; 2) South Fork/Rivanna Watershed of Virginia, managed by the Virginia Department of Forestry; and 3) the Upper Neuse Watershed of North Carolina, managed by the Conservation Trust for North Carolina. Each grantee established a process for engaging private landowners in watershed conservation programs and linking these landowners with water consumers. Although these processes were similar, they varied to meet local needs. Each also developed an approach for generating a sustainable source of revenue.
- 3) **Goal:** Test, implement, and demonstrate how best to engage non-industrial private forest landowners to adopt practices, technologies, and approaches to improve forest management, enhance forest health, increase the footprint of forest cover.
Accomplishment: All three subgrantees were successful in engaging non-industrial private forest landowners. Strategies varied across watersheds depending on local conditions and culture. Conservation practices were implemented on more than 66,000 acres across the three project areas. *Development of Forest Stewardship Plans was the more popular practice that encompassed the largest number of acres.*

- 4) Goal: Link water consumers with water producers (owners of forested watersheds) as a means to monetize water as an ecosystem service.

Accomplishment: One of the three watersheds was successful in this endeavor and the other two made significant progress. In summer of 2011, Raleigh instituted a watershed protection fee that averaged about 40 cents/household/month. This generates nearly \$2 million annually for watershed protection. We consider their effort a complete success. In the South Fork/Rivanna Watershed, efforts are still underway to establish a watershed protection fee. Concerns about costs associated with reservoir dredging have slowed watershed protection efforts, as have heated local politics regarding water. In the Upper Delaware River Watershed there is still potential to establish a revenue stream for watershed protection. The sheer size of this watershed and the weak economy in cities such as Philadelphia has hindered watershed protection efforts. The Endowment is continuing work in both the South Fork/Rivanna and Upper Delaware to further watershed protection efforts and in particular to develop a revenue stream from consumers for this purpose.

- 5) Goal: Use Geographic Information Systems to identify and prioritize land resources and conditions within target watersheds.

Accomplishment: This goal was accomplished in all three watersheds. Each developed a very valuable and practical system for prioritizing watershed protection needs based on water quality and quantity. It is important to note that the approach and technology used by these grantees has been shared with many other partners across the country, providing an excellent example of technology transfer.

- 6) Goal: Develop watershed health indices to help prioritize areas for watershed protection and management.

Accomplishment: Watershed Health Indices were developed in all three watersheds. These not only helped prioritize watershed protection efforts based on water quality and quantity, but in some cases factored in economic advantages associated with watershed protection. Watershed Healthy Indices were particularly important in helping build the connection between water users (such as water utilities) and water producers (forest landowners.). Maps illustrating priority areas for water conservation were particularly important in helping convince water consumers of the importance of forest land protection.

Were the goals and objectives met? If not, what were the barriers to completion?

Most of the goals for this ambitious project were met, as described in the previous section. One of the three grants has succeeded in creating a payment for watershed service program; the other two are still in development and may be realized in the future. The barriers to successful establishment of a payment for watershed services approach are significant under any circumstance, but were particularly daunting in the Upper Delaware River Watershed. The Pinchot Institute for Conservation identified the following barriers that still must be overcome before a payment system may be established:

- Hundreds of drinking water purveyors among the four states and 840 municipalities experience different quality and flow situations and may be more or less insulated from influences in the headwaters.
- Waste and stormwater concerns may surpass source water issues. For example, the Philadelphia Water Department must comply with regulations regarding stormwater; a recently enacted stormwater fee created an outcry, increasing the political difficulty of new fees for source water protection.

- Purveyors are concerned about impacts of rate increases and spending decisions on economically disadvantaged communities.
- There are few drinking water storage reservoirs in the basin, and most face few nonpoint pollution issues. Sedimentation and the resulting dredging costs are not major concerns for reservoir managers.
- Water is withdrawn directly from the main stem of the river at many points, so each facility deals with different quality and quantity issues.
- Few water bodies are impaired. There is no Total Maximum Daily Load (TMDL) or similar pollution goal requiring collective action.
- There are no filtration avoidance decrees within the Basin; most water providers have sufficient treatment infrastructure in place.
- Water scarcity is rarely an issue in the basin.
- Catastrophic wildfire and resulting sedimentation/flooding is not an issue.
- Measuring success and attributing actions to results will be difficult: the goal for the upper Delaware is to maintain existing water quality, so we hope for no changes rather than drastic improvements in indicators and there are many confounding factors beyond our control that could influence water quality in the main stem of the River.

Was the project completed on time? If not, what were the reasons for extending the timeframe?

A one-year extension was requested and granted, primarily to allow additional time for the three grantees to establish funding relationships with landowners during the economically-challenging times encountered during the course of this project. The economic crisis and other unforeseen factors increased the complexity, and hence duration, of negotiations on restoration and conservation activities.

For example, in the Charlottesville, Virginia, area, the economic uncertainties caused landowners to be very cautious about entering into any agreements. This meant that the Virginia Department of Forestry had to work harder to convince landowners to participate in the program, and they had to cast their net wider to engage more landowners.

In the Delaware River Watershed, landowners were addressing the challenges and opportunities provided by natural gas exploration. Many were simply waiting to see what would happen with gas leasing prices, and therefore wouldn't commit to conservation activities.

Who are the customers that benefit from this grant?

Multiple customers benefitted, including:

- Hundreds of landowners who participated in cost-share programs for conservation activities on their land;
- Consulting foresters in all three regions were actively engaged in watershed issues, which are not traditionally their forte;
- Water consumers in all three areas will benefit from the conservation projects that have been implemented. These projects will protect or improve watersheds, which will in turn benefit water quality, reducing water treatment and storage costs. The citizens of Raleigh will benefit even more, in that there is now a sustainable funding stream devoted to watershed protection;
- Land Trusts and land conservation organizations in the project areas benefitted from enhanced contact with NRCS District and State Conservationists; these relationships will provide benefits long after grant funds have been expended;

- The water conservation community nationally has benefitted. All three projects have produced valuable data that will make future watershed protection efforts more successful. The Raleigh success in particular has stimulated new efforts across the country.

Were project funds spent as anticipated? If not, describe major changes in the budget

Yes, project funds were expended as anticipated. Minor adjustments were made in subgrantee budgets to address unforeseen circumstances, but no major changes were made.

What methods were employed to demonstrate alternative technology in this project?

The primary method of interest was the concept for a long-term or sustainable source of funding from water consumers to help support watershed protection. Watershed protection financial needs far outstrip available funding sources, such as government grant programs. The only practical approach for raising the funds needed is to call on water consumers to support protection efforts for the watersheds that supply their water. This approach could include strategies such as watershed protection fees added to monthly water bills (the Raleigh model), changes in water utility base budgets that include watershed protection along with traditional infrastructure, conservation ballot measures, and other schemes. If we can make this approach more common, it will revolutionize funding for land conservation, with many benefits beyond watershed protection.

What were the quantifiable physical results from this project?

- Conservation practices implemented on more than 66,000 acres. These investments will pay water quality, wildlife habitat, carbon sequestration, and other dividends for decades;
- A sustainable funding stream for watershed protection of the Upper Neuse Watershed, Raleigh's water source. The joint NRCS/Endowment investment of \$1.7 will result in nearly \$2 million *annually* invested in watershed protection for the indefinite future;
- Prioritized watershed protection maps for all three watersheds. These maps are already being used by other funding sources to pinpoint investments; thus, the outcomes of the NRCS/Endowment project will save other investors time and money required to identify priorities;
- Models to evaluate the cost-effectiveness of green (watershed protection) vs. grey (built infrastructure) investments by the three communities; these models are already being adapted for use in other areas.

What were the economic results?

The primary economic result was the establishment of a watershed protection fee in the Raleigh watershed that generates nearly \$2 million annually for watershed protection. A secondary but equally important economic result is the models that were created to compare the cost-effectiveness of green and grey infrastructure. These models are essential for decision-makers to weigh the costs and benefits of watershed protection investments.

Are there Federal, State and local programs that may be used to implement this project?

The methodology that was tested through this partnership—sustainable funding sources from water consumers—may be supported through federal, state, and/or local programs. Most communities will require some level of support to get a payment for watershed service-type project up-and-running. Any number of sources could be tapped for this support.

What are the major recommendations resulting from this project?

- Continue and encourage the “grants leveraging funds” category for the CIG program, particularly as a way to attract non-federal sources of funding for NRCS interests and as a way to engage qualified partners in more extensive development of specialized program areas, such as watershed protection;
- Develop more successful pilot projects for payment for watershed service approaches. As witnessed by the barriers encountered in the Delaware River Watershed, water utilities and local decision-makers have many competing interests for funding and attention. Watershed protection is growing as a priority, and the best way to continue this growth is to demonstrate the feasibility and benefits of watershed protection at the local level. The Raleigh success in this partnership should be replicated elsewhere to help make watershed protection a more standard practice
- Identification of future sites for proposed payment for watershed service type approaches should include filtering criteria based on successes and challenges encountered in this partnership. Not every watershed lends itself to this approach; identifying those areas where success is more likely will expedite outcomes.

Introduction

A brief overview of the project: who, what, where, when and how?

This project was initiated and coordinated by Carlton Owen, President and CEO, U.S. Endowment for Forestry and Communities. Owen is a forester and wildlife biologist with nearly 40 years of experience in both the for-profit and not-for-profit sectors. Among specific accomplishments related to this initiative, he was the originator of Project SHARE (Salmon Habitat and River Enhancement) in Maine that yielded strong support from private forest owners in voluntary conservation practices designed to protect habitat for threatened Atlantic salmon. He also pioneered and marketed the idea of tying open space conservation with economic development via “Acres for America” – the highly successful program that has seen WalMart commit to a 10-year, \$35 million investment to off-set every acre of the company’s U.S. development footprint. To date the program has led to conservation of more than 700,000 acres of vital wildlife habitats – nearly a five-fold gain over the 10-year goal.

To address the important issue of conserving and managing forested watersheds as an approach to protecting drinking water supplies, the Endowment proposed using the “Grants Leveraging Funds” category to create a pool of funds that could be used to support projects for key projects in 2-3 watersheds. The Endowment proposed to provide \$2,000,000 for a one-to-one match of \$2,000,000 in Conservation Innovation Grant (CIG) “Grants Leveraging Funds.” The Endowment would then seek to generate additional leverage from sub-grantees through in-kind or cash-match. Thus, at a minimum, a \$2 million CIG investment would generate \$6 million in programmatic impact. *The Endowment did not use any of the CIG funds for overhead--100% of the CIG funds and the Endowment match were designated for on-the-ground project needs.* The Endowment has invested another \$200,000 in in-kind staff support for project management/oversight.

Sustainability of outcomes

It is very important to note that the Endowment’s goal with this Initiative was to pilot projects that would develop sustainable or long-term sources of revenue to further project goals. In the Raleigh, NC project, for example, the subgrantee helped facilitate a watershed protection fee that generates nearly \$2 million annually for watershed protection. Thus, the NRCS investment in this project (\$850,000) not only resulted in immediate, on-the-ground conservation benefits—it also put into place a funding

stream that is likely to increase and continue for many years. *We consider this to be an extraordinary outcome.*

The Endowment proposed an open and inclusive process with NRCS-designated parties being a part of the overall review and decision-making process at multiple levels – initial selection of watersheds and partners through to determination of on-the-ground practices and EQIP-eligible sub-grantees.

The scope of project tasks

Using this approach, the Endowment established a thematically-targeted, geographically-focused sub-grants program in three (3) watersheds in the Eastern U.S. for the purpose of advancing water management and conservation through watershed health and forest retention. The goal of this initiative was to pilot innovation of programs, technologies, and strategies with Environmental Quality Incentives Program (EQIP)-eligible non-industrial private forest landowners and certain identified agricultural producers (where forestry is a higher and better use of certain lands) at scales that yield not only measurable results but that also can be transferred nationwide to many other private-ownership dominated forested watersheds.

Project goals and objectives

The specific goals of the project were to:

- Identify workable/acceptable technologies, strategies and approaches that incent forest owners to retain working forests in part to meet ecological services outputs (water);
- Evaluate, through conservation practices, the effectiveness in generating critical mass to achieve outcomes; and
- Determine methodologies that can be readily transferred to other watersheds across the nation.

Business or academic relationships that facilitated the project, including leveraging

One important advantage that the Endowment brought to this project that was facilitated by the “Grants Leveraging Funds” approach is the business and academic relationships we have developed over the years. The Endowment’s staff is well-versed in forestry and forested watershed issues. This allowed us to develop project criteria specifically suited to the specific project needs of this proposal. We were also able to then work within the forestry and watershed communities to ensure that proposals were developed that ensured valuable results from this process. Once sub-grantees were selected, the Endowment continued to manage the development of the individual grants, helping ensure good progress and outcomes, as well as communication among the project partners. The Endowment has also played a strong role in sharing project outcomes with the broader forestry, ecosystem services, and watershed communities.

How the project was funded

NRCS provided \$2 million in cash, matched by \$2 million in cash from the Endowment; all \$4 million went to subgrantees for on-the-ground project expenses. The Endowment did not use any NRCS funds for overhead; an additional \$200,000 was provided by the Endowment to cover all administrative costs. The three subgrantees provided an additional \$4,660,000 in project match. Thus, a \$2 million investment by NRCS resulted in a total on-the-ground impact of \$8,660,000. This does not included

additional millions being spent annually through practices created as a result of this grant, such as the nearly \$2 million generated through the Raleigh, NC, watershed protection fee.

Benefits of the Grants Leveraging Funds approach for NRCS

In summary, the “Grants Leveraging Funds” approach provided the following benefits to NRCS:

- One-to-one match of cash (\$2 million from NRCS and the Endowment);
- Additional match of \$4,660,000 from the three subgrantees;
- Relief to NRCS in terms of grant administration—NRCS administered one grant to the Endowment, and the Endowment managed the three subgrants;
- Continuous oversight by the Endowment of the three subgrantees, helping ensure robust project outcomes. The NRCS administrative burden imposed by the CIG program does not typically allow NRCS the luxury of this sort of grantee oversight and interaction;
- Improved communication among subgrantees as their projects developed, helping ensure that each learned from the others as projects developed, reducing the potential for “reinventing the wheel;”
- Improved communication of project results to the broader forestry, ecosystem services, and watershed communities. The NRCS grant administration burden is such that this level of critical communication is just not practical in most instances.

This CIG experience leads the Endowment staff to conclude that the “Grants Leveraging Funds” approach for specific issues (such as forestry, watershed management, ecosystem services) provides strong benefits to NRCS in terms of reduced administrative burden, expanded funding reach, improved project results, and enhanced communication, *without NRCS losing any project oversight or control*.

Background

Problem the project was intended to address.

More than a decade has passed since New York City (NYC) entered into an historic Memorandum of Agreement with U.S. Environmental Protection Agency (EPA) (January 21, 1997) designed to positively affect the surface and groundwater watersheds that supply potable water to 9 million people. The agreement provided a waiver from EPA that avoided or significantly delayed \$6 billion in filtration system investments and \$300 million in annual operating costs to NYC. (*Watershed Management for Potable Water Supply: Assessing the New York Strategy, 2000*).

While high-visibility watersheds, such as the Chesapeake Bay and the NYC system, have been the subject of heavy public investment to enhance water quantity and quality, smaller watersheds that supply water needs for the majority of the nation’s population have not received similar attention. Water has for decades been a concern of western communities where limited rainfall and water rights issues combine to put water and watershed management on the public policy radar. In the face of population growth, increasing demands, climate change, and shifting rainfall and land use patterns, areas in the Eastern U.S. that never considered potable water needs as an issue are awakening to new challenges. Recent national attention to a multi-year drought’s effects on water supplies for greater Atlanta serves as a

prime example. The Government Accounting Office reports that 36 states anticipate water shortages over the next decade.

Seventy percent of the Earth's surface is covered by water, but less than 1% is freshwater. The cleanest water flows from healthy, forested watersheds. Forest Service data suggests that nearly two-thirds of the nation's citizens (180 million people) obtain their water from forests (*Climate Change and Water, USDA Forest Service, June 2008*). At the same time, the Forest Service projects that as much as 44,000,000 acres of forests – primarily in the east and south – will be lost to non-forest uses by 2030 (*Forests on the Edge, USDA Forest Service, May 2005*). Unsustainable draws on groundwater must be added to the mix. For example, the State of Mississippi -- a heavily forested state -- uses 2.5 billion gallons of water each day with 80% coming from 18 major aquifers. (*Mississippi Land Marks, Mississippi State University, Fall 2008*). Rapid depletion of aquifers is driving policy makers to look at surface water to meet growing demand. The Toyota plant in northeast Mississippi required one million gallons of water daily, all to be drawn from surface waters by the City of Tupelo that switched from ground water to surface water 20 years ago (*Mississippi Land Marks*).

Thus, climate change and shifting rainfall patterns, continuing loss of forest to non-forest uses, population growth, and the need to shift from groundwater to surface waters are a perfect storm that will make water in the Eastern U.S. a high priority for sustainable communities in years ahead.

Healthy, resilient watersheds are the best insurance for changing and uncertain ecosystem patterns. To address these challenges it is vital that the ecosystem services value of forests and certain agriculture lands that would be better in forests – especially as relates to water quantity and quality -- be addressed in ways that yield greater attention to retention and sustainable management of healthy, well-managed working forests and farms.

From the economic standpoint, there is increasing evidence that watershed conservation is less expensive than building new water treatment and storage facilities. Thus, it is more cost effective for water consumers to invest in watershed protection – or at least to co-invest in both green and grey infrastructure -- in that this will help reduce water treatment and storage costs in the future.

A brief account of previous attempts to solve the problem.

There are examples of communities that have created long-term or sustainable funding streams to protect watersheds. The goal of this CIG project was to create new pilots and to document successful approaches that could then be used to help accelerate watershed protection in other parts of the country.

Previous efforts have focused on government appropriations, conservation ballot referenda, fees on water consumers, and changes in utility base budgets to address watershed protection needs. These approaches have been largely piecemeal and typically have not documented successful and unsuccessful strategies that would in turn benefit other areas. This CIG Initiative was intended to help remedy this situation.

How the problem is usually dealt with today.

Typically, water consumers and communities only begin to think about their watershed health when there is a crisis, such as a wildfire that results in massive erosion, development that damages water quality, and forest health issues that degrade water quality. Although these crises do typically spur action to protect watersheds, it is obviously a poor strategy to wait until there is a crisis to take action. This CIG Initiative was launched in large part to help demonstrate that proactive watershed protection makes economic, cultural, social, and environmental good practice.

What agriculture or environmental sector could benefit by this project?

America's estimated 11 million private forestland owners are one key beneficiary in that they stand to receive income for providing clean water through protection and management of their watersheds. Although this project was directed at forestland owners, other agricultural producers are just as likely to benefit from the outcomes of this project.

An estimated 180 million Americans receive drinking water from forested watersheds. They will benefit from more cost-effective approaches to treating and storing their drinking water. Millions more will benefit from the other cultural, social, environmental, and recreation benefits provided by healthy watersheds. For example, massive quantities of carbon are sequestered in forested watersheds.

What natural resource issues are addressed?

Water quality and quantity are the direct focus areas for this project. Forestland owners will receive financial benefits, making it more likely that they will retain their forests instead of developing them. Fish and wildlife, including many at-risk species, will benefit from the habitat protected and improved through watershed conservation. Aquatic species in particular will benefit. Climate will benefit through the carbon sequestered in forested watersheds. Recreation lands will be increased in that forested watersheds are used by the public and private citizens for hunting, birding, fishing, hiking, and many other activities.

The negative effects of the problem on the environment, the community, or the producer's economic welfare.

Producers--At the root of this challenge is the concern that if forestland owners (or any agricultural producer, for that matter) don't receive adequate financial returns from their land, they will be tempted to sell it for development or manage the property for short-term financial gains that could have long-term, negative financial consequences. Although water and other ecological services are often promoted as potential sources of income for producers, actual examples of replicable financial developments are now just beginning to materialize. Thus, if water is not developed as a potential source of income for watershed owners, there will be a missed economic opportunity for landowners.

The community--If forested watersheds are not maintained in a healthy condition, the resulting decrease in water quality will have many negative impacts for water consumers. The quantity of water available could diminish, and water treatment costs could sky-rocket.

The environment—healthy watersheds provide critical habitat for a wide variety of wildlife, game, and at-risk species. Aquatic species in particular benefit. Forested watersheds also sequester vast amounts of carbon, providing broad-reaching climate benefits.

Review of Methods

The Endowment identified three watersheds that are directly linked to either a significant portion or the total supply for a target community's water supply. Watersheds were selected based on the following criteria, among other considerations.

- Provide potable water via surface water supply to a local community.
- Component of larger scale "Priority Watersheds" as recognized by USDA and/or EPA.
- Watersheds at-risk of accelerated loss of forest cover due to development pressures.
- Existing watershed conditions and trends with potential for measurable improvement of water quantity and water quality.
- Watershed scale, configuration, land management, and land ownership compatible with initiative objectives.
- A compatible framework of local land use programs, regulations, and controls that support a long-term watershed / forest management program.

Hence, watersheds were selected that have clear potential to provide a sustainable watershed management program through this conservation innovation initiative.

Another critical dimension of watershed selection was assurance of the willingness of community and water utility leaders to enter into the initiative. Identified watersheds/communities were mapped using Geographic Information Systems (GIS) to identify land resources and land management conditions within the watershed, as well as every ownership within the watershed by type and relationship/importance to downstream water flow. The database of owner information derived from this process was used to identify those land resources most critical for participation in the initiative (due to soils, slopes, or existing conditions), as well as the owners / potential cooperators in the project. Subsequent steps involved confirmation of EQIP eligibility, and other aspects of capacity to perform the requirements of the program.

Subgrantees developed a "Watershed Health Index" (WHI) to establish a baseline for each watershed and to prioritize and "value" each individual ownership with regard to its importance to water. These indices can interface with NRCS's "Rapid Watershed Assessment" (RWA) program, using applicable tools from RWA concepts to help assure this initiative is properly focused on watersheds with greatest potential for success. Also, this watershed selection and practice implementation program informed the NRCS "Conservation Effects Assessment Project" (CEAP), providing valuable insights to program effectiveness. The WHI was used to determine and implement a range of technologies, practices and policies to achieve desired outcomes, including stabilizing and expanding numbers of acres in well managed forests with water defined as a key output as well as identifying sustainable sources of revenue and community structure to support programmatic implementation that can be exported to other watersheds.

Conservation practices used in this program included: payments from water users to water producers via the water utility; conservation easements focused on water quality (e.g. priority lands and riparian zones); application of EQIP-eligible conservation practices to restore native and/or riparian forests; and education or incentive practices to increase application of Best Management Practices (BMPs). More exhaustive lists of specific conservation practices used by each subgrantee are described in their individual reports.

The initiative was founded on an active adaptive management approach that promoted learning by doing. By actively making decisions (instituting practices, etc.) and monitoring results the work improved understanding about complex systems and relationships.

What is innovative about the project, in terms of the equipment used, the management process employed, changes in timing, or anything about the project that makes it different from standard practice?

The Endowment used the Grants Leveraging Funds approach to reduce NRCS administrative burden and also, we believe, improve project results through increased attention to project management, communication among subgrantees, and outreach to the natural resource community with project results.

As stated above, as the project manager, the Endowment was able to spend considerable time with subgrantees to ensure strong proposals, project development, and communication of results. We feel that this approach—one NRCS grant to a trusted partner that in turn manages a smaller, very specific program, offers superior results for NRCS overall, without the agency losing any opportunity for input or oversight.

Compare the innovative portions of the project to existing practices to show differences in labor input, materials input, economic input and return, changes in production, or changes in the fate and transport of pollutants.

We believe that the NRCS administrative burden for this project was significantly diminished. NRCS administered one grant to the Endowment, which in turn managed the activities of three subgrantees. Furthermore, the Endowment was able to invest significant time with each of three subgrantees to ensure good communication and project development. Although NRCS grant officers would surely like to be able to spend this sort of time with their grantees, the sheer size of the CIG program and the lack of staffing prevent this investment for very practical purposes. And, the Endowment covered all administrative expenses, using 100% of the NRCS money for projects.

NRCS funds were matched one-to-one by cash from the Endowment, doubling the amount of money available for on-the-ground conservation. This is clearly very beneficial to NRCS when budgets shrink or when new priorities cannot be funded to the level needed.

By conserving watersheds, less sediment and accompanying nutrients and other chemicals are prevented from reaching waterways and drinking water supplies. This reduces water treatment and storage costs for communities.

If part of the project revolves around marketing an alternative product (example: composted manure), describe how the potential market was analyzed, economic projections, and any actual marketing activity that took place.

Although the goal of this project was not to develop an alternative product in the traditional sense, the goal was to create a new *approach* for watershed conservation by engaging local communities in programs to protect their watersheds. For this particular project, a detailed RFP was developed that outlined the conditions that we felt were necessary to help ensure project success.

Even more importantly, the Endowment has been using learnings and outcomes from this project to further understand and quantify how markets can be analyzed in the future to help ensure success for watershed protection initiatives. One strong advantage of having an organization such as the Endowment manage this project is that we began using preliminary results from this project to advance this effort. Thus, this process began after year 1 of the project and will continue into the future. For example, the Endowment recently received a small grant to analyze other NRCS investments in watersheds, and we have held meetings to draw in the broader water community on this process.

Describe what the producer had to do differently to accommodate the project, in terms of labor, maintenance, obtaining materials, feeding, milking, pasturage, cropping, or any other operation adjustments.

No significant changes were required by producers to accommodate this project.

Include a schedule of events that shows when components were built or installed, the period of time that data was collected, and any adverse events such as storms or equipment failure that affected the project.

July-September 2009: Screen and identify targeted watersheds/communities;

October 2009: Program implementation begins;

December 2013: Project concludes

Semi-annual reports were provided to NRCS throughout this period, and subgrantees made numerous presentations at meetings from the onset of program implementation. This is one of the key strengths of this partnership—the outside world began to hear about accomplishments as they happened, rather than having to wait years for final reports to be submitted.

One event that affected project implementation in the Delaware River Watershed was the onset of fracking in that region. Once landowners became aware that very significant sources of funding might become available for natural gas rights, their interest in conservation practices diminished or was put on hold. This slowed progress in this region somewhat.

In the South Fork Rivanna Watershed of Virginia, many landowners were suspicious of government funded or promoted land conservation practices as a result of all the regulation associated with being a watershed of the Chesapeake Bay. Also, as a result of funding that was available through Chesapeake programs, many landowners had already installed various conservation practices. This required the subgrantee in this area to expand the geographic scope of their outreach, which was in no way detrimental.

Include maps, diagrams, and other material that shows the location of the project, location of equipment and facilities, environmentally sensitive areas, etc.

See attachment XX

Summarize what worked, what didn't work, and why. It is important to know if parts failed or processes did not behave as expected, or maintenance was different than expected, in order to assess future projects.

Things that worked:

- Endowment management of three subgrantees;
- NRCS EQUIP conservation practices were valued by producers and implemented with success on more than 66,000 acres in three watersheds;
- A sustainable source of funding that generates \$2 million annually was launched in the Upper Neuse River Watershed of North Carolina, in the Raleigh area;
- Communication amongst the three subgrantees was excellent, and the natural resource community began to learn about project outcomes soon after the partnership was launched;
- The Endowment and the three subgrantees used adaptive management approaches successfully to overcome the challenges that developed in the course of the project. The Endowment's weekly communication with subgrantees facilitated this process;
- New and beneficial relationships were developed between subgrantees and NRCS state and district conservationists; and
- A one-to-one match of NRCS funding was generated, extending the agency's financial outreach by 100%.

Processes that did not behave as expected:

- Federal agency budget issues slowed commitments to producers in some cases;
- In the South Fork Rivanna Watershed of Virginia, landowner participation in existing Chesapeake Bay programs lessened the need for more cost-share opportunities. This challenge was addressed by expanding the geographic scope of their project.

What would be done differently in this project if it were started today?

The learnings generated through this project would allow us to better describe the conditions needed to successfully implement a payment for watershed service type project. For example, the Delaware River Watershed project subgrantee identified a number of barriers to successful establishment of a beneficiary pays approach to watershed conservation. Understanding these barriers would allow us to focus on watersheds where these conditions were either not present or could be minimized.

Discussion of Quality Assurance

While the Endowment was responsible for overall management of the initiative, each subgrantee established a technical advisory committee that included partners such as local conservation districts, water utilities, Cooperative Extension Service, Resource Conservation & Development Councils, NRCS area/field office, State forestry agencies, local or regional land trusts, land grant universities, conservation and environmental partners, federal agencies such as the U.S.D.A. Forest Service, and State departments of environmental quality.

Carlton Owen, President & CEO of the Endowment would have primary project oversight on behalf of the Endowment. Owen is a forester and wildlife biologist with nearly 35 years of experience in both the for-profit and not-for-profit sectors. Among specific accomplishments related to this initiative, he was the originator of Project SHARE (Salmon Habitat and River Enhancement) in Maine that yielded strong

support from private forest owners in voluntary conservation practices designed to protect habitat for threatened Atlantic salmon. He also pioneered and marketed the idea of tying open space conservation with economic development via “Acres for America” – the highly successful program that has seen Wal-Mart commit to a 10-year, \$35 million investment to off-set every acre of the company’s U.S. development footprint. In has already conserved more than 700,000 acres of vital wildlife habitats – nearly five-fold the 10-year goal.

Project site description: characteristics of the site, sample locations, rationale for locations, map.

See attachment #X and detailed information for the three sites included in the subgrantees individual reports. In a nutshell, three watersheds were selected:

- 1) The Upper Delaware River Watershed of New York, New Jersey, and Pennsylvania;
- 2) The South Fork Rivanna Watershed of the Charlottesville, Virginia, area; and
- 3) The Upper Neuse Watershed of the Raleigh, North Carolina area

These three watersheds were selected through a competitive RFP process that described in detail the desired conditions for project partners.

Sampling design. Include the precision level of measurements, completeness (will data be sufficient), how samples and measurements truly represent what is occurring, and comparability (can the project situation be compared to real-life situations).

The design for this project was based on a number of criteria, including that the selected watersheds:

- Provide potable water via surface water supply to a local community;
- Are a component of larger scale “Priority Watersheds” as recognized by USDA and/or EPA
- Are at-risk of accelerated loss of forest cover due to development pressures;
- Have potential for measurable improvement of water quantity and quality;
- Have watershed scale, configuration, land management, and land ownership compatible with initiative objectives; and
- Offer a compatible framework of local land use programs, regulations, and controls that support a long-term watershed / forest management program.

Sampling procedures: Describe collection methods, collection frequency, equipment used, volume or amounts sampled, and how samples are handled, stored, and transported.

This does not directly apply to this project.

Custody procedures: Describe chain-of-custody procedures for samples and data.

This does not directly apply to this project.

Calibration: What, if any, field equipment will require calibration & how will it be done.

This does not directly apply to this project.

Sample analysis, quality control: Cite analytical procedures to be used in the field or laboratory, sub-sampling or sample preparation, units of measure to be used. Describe limits of detection. Describe quality control processes.

This does not directly apply to this project.

Discuss data reduction, analysis, review, and reporting: How raw data is converted and presented, who reviewed it, and how the final presentation was derived.

This does not directly apply to this project.

Findings

Enumerate the physical and economic findings of the project. Show how the findings did or did not support the goals of the project.

This project resulted in the following:

- Conservation practices implemented on more than 66,000 acres in three watersheds;
- In one of the three watersheds, a long-term, sustainable funding source was created for watershed protection—this was the priority goal for this effort. In the Upper Neuse Watershed of North Carolina, Raleigh instituted a watershed protection fee that averages about 40 cents/month that will generate nearly \$2 million annually for watershed protection. This outcome directly supported the desired outcomes for this project;
- In the other two watersheds, a sustainable funding source has not yet been established, but the subgrantees and the Endowment continue to develop this potential;
- In each of the three sites, a watershed health index or similar system was developed to help rank land conservation priorities based on water quality benefits. This map and priority list will doubtless be used by many other groups for years to come, providing another lasting benefit for the NRCS investment;
- In the South Fork Rivanna Watershed of Virginia, a very helpful model was developed that allows decision makers to determine the mix of natural and built infrastructure that optimizes benefits to their community. A similar model was created in the Upper Neuse Watershed of North Carolina that also allows decision-makers to determine the costs and benefits of proposed rate increases. These two models are already being adapted for use in other watersheds, providing another benefit from the NRCS investment.

Each of these outcomes directly supports the goals of the project. As stated previously, the specific goals were to:

- Identify workable/acceptable technologies, strategies and approaches that incent forest owners to retain working forests in part to meet ecological services outputs (water)—this was accomplished primarily through the installed conservation practices. Landowners were in general very receptive to using cost-share programs to improve management of their forests. In one of the three watersheds, a sustainable funding source for watershed protection was developed.
- Evaluate, through conservation practices, the effectiveness in generating critical mass to achieve outcomes—in each of the three project sites, consulting foresters and others who interact with hundreds of landowners became familiar with the project and encouraged their clients to participate. Although this was a pilot effort, significant acreage was improved in each watershed to have water quality and quantity impacts;
- Determine methodologies that can be readily transferred to other watersheds across the nation—watershed health indices, decision-making models, and sustainable funding sources are all methodologies that can and are being actively transferred to other watersheds, providing very significant impact for the NRCS investment.

Conclusions and Recommendations

Summarize the conclusions to be drawn from the project, recommend how the technology should be studied further, how it should be brought into common usage, or why the technology is deemed not useful. If the technology is recommended for common usage, include an operation and maintenance recommendations. Identify the next steps in bringing this technology to the field.

Conclusions: the Grants Leveraging Funds category provides significant financial match benefits for NRCS. Even more importantly, having a partner such as the Endowment manage a specific portfolio of subgrantees saves NRCS administrative costs, and facilitates much for intensive and beneficial project management, which in turn provides better outcomes for the agency and all partners.

How should the technology be studied further? The Endowment has concluded that payment for watershed service type projects could be implemented in many other areas around the country. To achieve this goal will require more successful pilot projects (such as the Raleigh project funded in this study) and broader acceptance of the methodologies undertaken, such as watershed health indices and decision-making models. It is particularly important to get the water utility community more thoroughly engaged in this process. The Endowment is currently pursuing this strategy.

How can the technologies developed be brought into common usage? This is an essential question. As suggested in the previous answer, broad acceptance of beneficiary pays systems is the ultimate goal. This will require a culture change by water utilities. This necessitates more successful pilot projects to show them that watershed protection benefits water quality and reduces treatment and storage costs, and that water consumers are willing to pay a little extra to take care of their watersheds. The Endowment is engaged with a variety of partners to help facilitate this cultural revolution within the water community, and the learnings and outcomes from the NRCS project will play a critical role in helping bring about this change.