FY 2014 Conservation Innovation Grant National Awardees

Below is a list of the Fiscal Year 2014 Conservation Innovation Grants National awardees. The information includes the project location, the amount of funding, the project title and a brief description of activities and anticipated outcomes.

Alabama Mountains, Rivers and Valleys RC&D Council (AL) $33,000
Rainwater Collection, Storage, and Use on Small Farms…New and Beginning Farmers and Historically Underserved

Providing adequate water for livestock and vegetable crops on an appropriate scale is a problem for many small farmers. Most do not have irrigation systems, cannot leverage economies of scale to obtain them and have not historically participated in USDA programs to address these challenges. In addition, rainwater runoff can move sediment and nutrients into area streams, impacting water quality. This project will assist historically underserved producers with implementing practices to capture and store rainwater runoff from farm buildings thus reducing soil erosion and nutrient and sediment runoff to streams, and increasing the sustainability of small farms by improving access to affordable irrigation systems based on appropriate technology.

B.F. Smith Foundation - Delta F.A.R.M. (MS) $438,750
Mississippi's Soil Health Initiative: Fostering Awareness, Belief and Understanding through Local Experience and Evaluation

A true understanding of soil health is lacking among the majority of Mississippi row-crop producers. In part, this is due to supporting practices (e.g. cover crops and no-till) being locally researched and utilized as stand-alone practices, not as a system to improve soil health. For producers to truly understand soil health and the system of management practices to be adopted, they must gain firsthand knowledge and experience of soil health systems as they are successfully applied on local farms. To develop a true understanding of soil health, producers must first be personally and socially motivated to learn with an open and growth oriented mindset. This desire to learn must then be supported by local experience and knowledge that demonstrates how soil health systems are implemented successfully. This project will demonstrate and field test soil health systems on 12 farms and 2,400 acres. Demonstrated soil health systems will be evaluated for improvements in soil and water quality using traditional and innovate methods. Production data associated with demonstrated systems will be tracked using an online platform to facilitate aggregated data analysis. Economic analysis will provide insight as to the profitability of soil health systems and will incorporated into enterprise budgets. An e-based toolbox will be developed to host all information and guidance developed through the project and serve as hub for connecting local producers to existing information and tools.

Board of Regents of the University of Wisconsin System, UW-Extension (WI) $571,708
Developing Wisconsin's Farmer Network for Nutrient Use Efficiency and Water Quality

Managing nitrogen (N) successfully for crop production can be a challenge. Whether N is applied as fertilizer or manure, it can quickly transform into nitrate, which can be easily leached through the soil profile. To combat this issue many farmers use a variety of N management practices intended to minimize losses and optimize uptake by the crop. These practices might include multiple split-applications, use of controlled release fertilizers, avoiding early fall applications of manure when possible, or using cover crops. One benchmark a farmer can use to evaluate the relative environmental and economic efficiency of their N management practices for corn production is nitrogen use efficiency (NUE). Through the development of a farmer network for nutrient use efficiency and water quality, farmers will learn which operation records and methods are necessary to complete the NUE assessment. Participants will learn how to conduct their own nitrogen use efficiency assessments, and evaluate the effectiveness of different cropping practices designed to decrease N loss through leaching or volatilization.

California Dairy Research Foundation (CA) $73,000
Improving Conservation Practice Adoption and Nutrient Management Plan Implementation through Utilization of Adapted Decision Support Tree eLearning Methods

California is home to 1.8 million dairy cattle, over 80 percent of which reside in the state's Central Valley, an area rich in agriculture and responsible for nearly 20 percent of the nation's milk supply. Central Valley dairy farms produce much of the forage necessary to feed their cows by utilizing manure nutrients to grow crops year-round. Cow manure is an important renewable resource used to fertilize crops, replenish soil nutrients and enhance soil quality. Utilizing manure effectively is paramount to sustainable dairying and agriculture, but has been regulated since 2007. Regulatory requirements include the maintenance and implementation of both waste management and nutrient management plans. The industry's regulatory and environmental success depends on individual dairy producer ability to identify and adopt conservation practices and implement superior nutrient management to protect scarce surface and ground water resources. Multiple potential challenges exist which may prevent full implementation of all aspects of nutrient management and available conservation practices within a given operation. Barriers are most often site-specific and require individual assessment of current systems, equipment and practices to determine optimal farm solutions. This project will develop, field-test and demonstrate the use of an electronically available teaching and learning (eLearning) system as an innovative approach to conservation practice adoption and nutrient management implementation. A proven decision tree support system will be adapted into an eLearning format to enable individual farm nutrient management needs assessment. Its guiding principles will be communicating scientifically-proven yet practical, cost-effective options at various nutrient

management system critical control points (decision tree nodes) to assist producers in identifying site-specific solutions for full nutrient management plan implementation.

Clemson University (SC) $265,072
Demonstration of Innovative Nutrient Management Strategies Combined with Soil Amendments to Enhance Fertilizer Use Efficiency, Farm Profits and Environmental Quality

On average, growers in the U.S. apply about 90 lb/acre nitrogen for cotton, 140 lb/acre for corn and 90 lb/acre for wheat, for a total of 9 million tons for these three crops. High production costs make it increasingly important for our growers to reduce crop input costs while maximizing yields to stay competitive in the global market. For example, a 20 percent reduction in nitrogen usage could save cotton, corn and wheat growers over $1.8 billion annually. Several researchers across the cotton and corn producing states have developed algorithms for nitrogen fertilization based on optical sensors. However, nitrogen application algorithms developed in other regions either under or overestimated nitrogen rates for crop production in the Southeastern Coastal Plain region. The overarching goal of this demonstration project is to assist cotton, corn and wheat farmers in the region to adopt sensor-based nitrogen application (SNA), an innovative and proven conservation technology for achieving 4R nutrient management. The system is designed specifically for Coastal Plain region to account for soil and climatic characteristics. It combines sensor based, site-specific nitrogen application with soil amendments based on soil management zones and will enhance nitrogen use efficiency and farm profitability while substantially reducing nitrogen use and its adverse impact on ground and surface water quality by applying fertilizer at optimum rates. This technology is designed to assist farms of all sizes – especially small-scale, limited resource operations. Compared to uniform rate applications, the SNA system has the potential to reduce nitrogen usage by 30 to 70 percent in cotton, corn and wheat production.

Copper River-Ahtna Inter-Tribal Resource Conservation District (AK) $640,000
Ahtna Region Resource Assessment, EQIP Habitat Tool Development and Inter-Tribal Conservation District Technology Transfer: A Groundbreaking Project for Alaska

The Natural Resources Conservation Service has recognized Alaska Native Corporation as agricultural lands and subsistence food production and harvest as an agricultural product. Native private corporate ownership in Alaska is over 44 million acres. This has created a significant number of historically underserved and beginning farmers. In addition, tribal conservation districts are being developed to help serve these landowners in Alaska. Many of the traditional NRCS EQIP and other practices need to be adapted to Alaska and applied in new, innovative ways. In addition, tools such as ecological site descriptions are needed in Alaska to help effectively link NRCS programs and practices with beginning farmers and their unique subsistence resource production issues. This project will develop technical expertise on wildlife, habitat and forestry and provide advisory services to land managers for two native corporations

and eight regional tribes. These activities will help NRCS better serve its primary clientele in Alaska and will help other tribal conservation districts recognize their opportunities to positively support sustainable subsistence food production in their districts.

County of Carlton (MN) $107,313
Implementing Whole-Farm Approaches to Improve Soil Health and Farm Resiliency in Northeast Minnesota

In northeast Minnesota, farm profitability and resiliency are declining as a result of poor soil health. Historically, NRCS has guided the area's farmers and ranchers on individual conservation practices such as: rotational grazing, out wintering cattle and reduction of tillage on crop land. These efforts have shown varying degrees of farmer adoption because the individual conservation practices have not been well integrated into the whole farm production system and production goals. This project will demonstrate and evaluate an innovative whole farm approach to soil health by including a variety of conservation practices systematically. The implementation of this project will offer new potential for expanding EQIP and farmer adoption of soil health practices.

First Nations Development Institute (Navajo Nation) $68,706
Conservation Planning for Navajo Livestock Producers

A development freeze (preventing the erection of buildings, homes and community infrastructure) on lands disputed between the Navajo Nation and Hopi Tribe persisted from 1966 until 1999 when it was repealed. Only now are these communities beginning to initiate new development in this area that depends heavily on farming and ranching for livelihoods. This project will build on First Nations' work with Navajo producers started in 2011 with funding from the USDA Office of Advocacy and Outreach and others. These efforts revealed the need to transition first steps in conservation planning from USDA NRCS to the producers by developing a conservation process for Navajo producers in a manner that will balance traditional ecological stewardship with NRCS' requirements. 12,000 conservation plans on the Navajo Nation are stymied by the logjam created by lack of professional resources. This project will develop a conservation planning process, led by Navajo livestock producers on the Navajo Reservation, which will be offered as a template to USDA NRCS, the federal Bureau of Indian Affairs and the Navajo Nation. The conservation planning process could have the potential to remedy the issue of pending conservation plans at the producer level on the Navajo Nation and could be replicated in other Navajo communities and by other tribes.

Florida Department of Agriculture and Consumer Services (FL) $1,000,000
Farm Renewable and Efficiency Development (FRED) Program

Florida's 47,500 farms produce nearly 300 different commodities on more than 9 million acres of land and employ 2 million people, contributing over $104 billion to the state's economy each

year. Energy expenditures account for 6.5 percent of Florida farms' operating expenses, and nearly $375 million annually. This project will establish the Farm Renewable and Efficiency Demonstration program, which will create Mobile Energy Labs (MELs) that conduct on-site evaluations of the potential for energy efficiency and renewable energy upgrades on individual farms. After participating in an evaluation, farmers will be eligible for grants for the implementation of MEL recommendations. Emphasis will be placed on conducting outreach and technical assistance with historically underserved producers. Finally, a study will be completed on the effectiveness of the program, and the future energy needs of agricultural producers in Florida. Reduction of energy usage will result in not only monetary savings for farmers, but significant environmental benefits.

GrassWorks, Inc. (WI) $140,000

Transferring Innovative Managed Grazing Skills to Beginning Wisconsin Dairy Producers

The retirement of small and mid-sized dairy farmers and barriers to entry for aspiring farmers is resulting in an increase in large confinement dairy operations. These large dairies can alter local rural economies and rely on a less sustainable corn-based feeding system. Managed dairy grazing is an environmentally positive solution that can provide families with a solid income and lead to stronger rural economies. In managed grazing systems, livestock are rotated through paddocks of high quality grasses and legumes that are allowed to rest and regrow. This cost-effective method works with natural biological systems, relying on perennial forages and the productive capacity of soils. It is not only one of the best predictors of success for start-up farms but it also provides mid-career and retiring farmers with more options for investment and farm transition. This project will use an apprenticeship model to train next-generation farmers in managed grazing.

Holmes County Food Hub (MS) $640,775

Introducing Innovative Conservation Technologies to Assist Socially Disadvantaged Farmers in West and Central Mississippi

Production, conservation and marketing are all critical components of sustainable and profitable agricultural operations in Mississippi. Small-scale, historically underserved farmers are usually the last to adopt technological improvements and take advantage of opportunities to encourage new and enhance existing farm operations. This project will introduce innovative conservation technologies that encourage new and assist existing limited resource farm operations in west and central Mississippi. The project is intended to enhance the sustainability and profitability of historically underserved farm operations by integrating conservation technology such as plasticulture and subsurface irrigation with improved marketing strategies.

Kansas State University (KS) $230,618
Demonstrating Interactions between Reduced Tillage, Soil Water Storage and Nutrient Leaching under Water Limited Irrigated Cropping Systems

Factors such as growing global population and climate variability are increasing demand for water. Looking into the future, agriculture, the dominant fresh water user around the world will be required to produce more food with less water. This increase in food production is expected to come primarily from irrigated agriculture. In the United States Great Plains, producers are already experiencing problems of limited water supplies for irrigation due to Ogallala Aquifer depletion. Economies of many rural communities in the Central Plains rely heavily on irrigated agriculture, including confined cattle feeding operations, beef packing and agro-input businesses. However, with declining water supplies the future of irrigated agriculture in the Great Plains is uncertain. The goal when working with limited water is to capture and store every possible source of water in the production system. In the Great Plains these sources of water include rainfall, snowfall and irrigation water. Reduced tillage coupled with residue management have been proven in several studies to increase available soil water by reducing soil water loss from tillage operations, reduction in soil water evaporation and enhancing infiltration. This project will leverage advances in sensor and information technology to demonstrate proven benefits of reduced tillage on soil water storage using physical and virtual on-farm demonstrations.

Louisiana State University Agriculture Center (LA, MS) $232,232
Soil Health and Pasture Ecosystem Improvement from a Diverse Mixture of Cool-season Species Overseeded on a Warm-season Perennial Grass Pasture

Ecology concepts indicate that pastures of high species diversity can be more functional and potentially more productive than those of monocultures or simple two-species mixtures. Short term experiments have typically not confirmed superior forage or grazing livestock production of such complex mixtures. This project will introduce the concept of such multiple-species pasture mixtures for use in the southeastern U.S. and demonstrate realistic short-term beneficial effects. A complex pasture mixture of cool-season species on a commercial beef cattle operation will be established by over-seeding warm-season perennial grass pasture in October. Establishment and production of this mixed stand will be monitored with pasture areas which naturally develop differing stand composition used as reference areas to compare effects of species complexity on measures of soil health. Cumulative effects of diverse species mixtures in repeated years on subsequent warm-season grass productivity and soil characteristics will be assessed. Environmental effects anticipated from diverse pasture species, compared to nitrogen-fertilized grass monocultures, include biological nitrogen fixation, enhanced sub-soil nutrient uptake, increased nutrient uptake efficiency, reduced fertilizer requirements, reduced weed pressure, enhanced pollinator habitat, increased soil microbial biomass and diversity and increased soil organic matter providing carbon sequestration.

Montana State University (MT) $50,000

Demonstrating and Quantifying the Influences of Incentive Based Rest Rotation Grazing on Food Insects of Sage-Grouse, Rangeland Pollinators and Vectors of West Nile Virus

Greater sage-grouse populations have been in decline in the western U.S. since the 1950s. Many factors have been highlighted as explanations of sage-grouse declines with chick and brood survival being directly linked to annual recruitment; however, the specifics of these vital rates are a poorly understood component of sage-grouse ecology. Much research has been conducted on the selection criteria used by female sage-grouse when choosing a brood site and the results have provided a foundation for land management considerations aimed at improving sage-grouse habitat and ultimately recruitment of chicks. However, the criteria that female sage-grouse use for habitat selection may not provide insight into the relationship between the site resources and chick and brood survival. The mechanisms which influence daily chick and brood survival need to be better understood and these data should be used to establish a prerequisite program which implements habitat management strategies that affect annual recruitment and, ultimately, sage-grouse conservation. One thing which is known to positively drive chick and brood survival is the abundance of arthropods (insets, spiders, etc.) near brooding locations. Another component of chick and brood survival is the distribution of West Nile virus, a deadly infection transmitted to sage-grouse by mosquitos. Populations of pollinators (bees, butterflies, moths, etc.) have also been in decline in recent years. On rangelands, pollinators are a key component and provide essential services to the plant communities on which sage-grouse and their food arthropods depend. The project team's ongoing research shows that both food arthropods and pollinators benefit from the same land management practices. Specifically, the Sage-Grouse Initiative rest rotation cattle grazing program not only increases the abundance of food arthropods but that it also increases the abundance of pollinators in years with near normal precipitation. Other current research indicates that sage-grouse nest success is also higher in pastures enrolled in the Sage-Grouse Initiative. Ultimately, the some linkages are becoming clear in that sage-grouse, food arthropods and pollinators are dependent on similar habitat qualities. This project will further evaluate and demonstrate the benefits of rest rotation cattle grazing by developing metrics which land managers can use to assess food arthropod and pollinator habitat quality based on the vegetation diversity and structure. The distributions of vectors of West Nile virus based on the rest rotation grazing program will also be evaluated. These factors will be incorporated into land management practices which will also help keep ranches profitable and native landscapes, on which rangeland species depend, intact for future generations.

National Association of Conservation Districts (US) $750,000

Soil Health Advocates - Promoting and Documenting the Benefits of Soil Health Management

A body of research shows the benefits of practices such as strip/no-till, cover cropping and crop rotation. Some of these practices can be successful under certain soil and climate conditions, but not in others. More information is needed on what works well and under what conditions. Also, detailed economic and cost-benefit information is needed. This project will overcome barriers

and significantly increase the number of farmed acres nationwide that are successfully managed for soil health, appropriate to local conditions.

National Corn Growers Association (IA, IL, IN, MN, NE, OH, WI) $998,000
Economic and Environmental Benefits of Helping Crop Producers Focus on Soil Health

Agriculture currently comprises 55 percent of habitable land and 66 percent of annual fresh water usage and per capita land and water availability will decrease with increased population growth. Decreases in access to arable land place additional emphasis on the need for improved cropping system efficiency while improving environmental resources such as soil health and water quality. In the U.S., the major crop production regions facing the greatest challenges include the Mississippi River Basin, the Great Lakes Basin and the Chesapeake Bay Watershed. This project will address the need for improved soil health and water quality by developing recommendations to farmers on a variety of soil management practices aimed at improving productivity, profitability and environmental outcomes; increasing adoption of those recommendations beyond the network of demonstration farms; increasing the visibility and importance of sound soil management and agricultural sustainability to crop producers and the general public and quantifying the economic impacts (to individual crop producers and in aggregate) of adopting various practices intended to improve soil health.

Navajo Nation (Navajo Nation) $28,408
Using Innovative Techniques for Assessing Herbivore Animal Diet

Many unknowns exist regarding baseline data for natural resources on Native American reservations. Existing technologies to examine and assess wildlife diet are becoming more costly, time-consumptive, and inefficient in their abilities to produce reliable results. This project will help alleviate both issues by introducing a new and innovative technology for assessing wildlife diet for a Native American tribal wildlife resource. The new conservation technology may prove more efficient at producing results for wildlife than the old method, will provide baseline data for the Native American tribal Fish and Wildlife Department, and will provide knowledge that can then be transferred to Native American tribal natural resources personnel for future use in conservation efforts. The main objectives of this study are to 1) use an innovative conservation technology to assess wildlife diet for a socially and economically important natural resource: mule deer, 2) provide baseline wildlife diet data to the Navajo Nation Department of Fish and Wildlife for said natural resource, 3) compare results from the new diet assessment technique to an older, well used technique and 4) transfer the knowledge from the innovative diet technique to the Navajo Nation Department of Fish and Wildlife for future conservation use.

North Carolina Foundation for Soil and Water Conservation, Inc. (NC) $124,411

Defining Best Management Practices for Multi-Species Cover Crops in the Southeastern USA

Quantifiable impacts of multi-species cover crops need to be determined to promote rapid information transfer from county level demonstrations to producers throughout the mountains, piedmont and coastal plain areas of North Carolina. These demonstrations will broaden adoption of appropriate multi-species cover cropping and build soil health for a more sustainable agriculture across the Southeastern region. The project will quantify short term-changes in soil chemical, physical and biological properties as a result of using multi-species cover crops in various no-till and reduced till production systems across the three physiographic regions of the state. These short term changes in soil properties will be related to broader concerns for nutrient cycling, overcoming soil water limitations and improved crop yield and growth. Project results will include recommendations for refining best management practices for multi-species cover crops in production systems common to the Southeast.

North Carolina State University (NC) $121,094

Engineered Windbreak Wall-Vegetative Strip System to Reduce Pollutant and Odor Emissions from Mechanically-Ventilated Broiler and Swine Barns

Livestock farms are major sources of ammonia and odor and they also emit hydrogen sulfide, particulate matter (PM) and greenhouse gases that affect the environment, public health, visibility and quality-of-life of neighbors. The U.S. EPA may regulate livestock barn emissions under the Clean Air Act and it is paying particular attention to ammonia because it is released in large amounts and it is a precursor of fine PM (i.e., PM2.5) which impacts public health and visibility. Local ordinances and nuisance complaints could also force livestock producers to reduce odor emissions. Improving management practices can improve air quality marginally but to reduce pollutant and odor emissions from barns substantially and consistently many farms may require exhaust air treatment to comply with the Clean Air Act. While conventional exhaust air treatment technologies are effective, they are very expensive and they choke the ventilation system. One promising method is the use of natural windbreaks (trees and shrubs) that can reduce odors without affecting the ventilation system. But windbreaks require maintenance, have large footprints and cannot be placed close to the fans where they would be more effective. This project will develop a low-cost, engineered windbreak wall – vegetative strip system. Computational fluid dynamics modeling will be used to design the system, including, vegetation height and density and wall features (e.g., height, angled or vertical) to maximize effectiveness by balancing pollutant removal, dilution to reduce odors and acceptable back pressure on the fans. Two systems will be installed to treat the exhaust gases of tunnel-ventilated livestock barns (roaster and swine) and monitored over two years. Inlet and outlet gas, PM and odor concentrations will be measured to evaluate treatment effect. Concentrations of pollutants and their fates will be determined using soil and plant analyses and compared with control areas.

Finally, cost-effectiveness of the system will be determined based on reductions in $/kg of the pollutants.

North Carolina State University (NC, GA) $995,710
Soil Health in Diverse Forage Systems on Beef Farms

Beef cattle contribute a major portion of pasture-based livestock production in the US and these systems support the nation's single largest agricultural commodity. About 30 percent of the total cow population (8.7 million head) is in the Southeast, Mid-South and Mid-Atlantic regions. Beef cattle in the region are typically managed in low input systems that result in poor pasture condition and can have negative environmental impacts including loss of vegetative cover, soil compaction, nutrient concentration, erosion and nutrient loss through runoff and direct deposition of manure into surface water. Many best management practices, such as stream exclusion, have been developed to address these concerns. While these approaches are generally beneficial, their installation in the absence of a good forage system plan and improved producer management skills limits their overall benefit. Because of high input costs and the value of cattle the interest by beef producers in thoughtful pasture and forage management is increasing. This project will combine nutrient distribution mapping, grazing season extension using stockpiled forages, strategic use of annuals in locations of high soil nutrient concentrations, emerging concepts about soil health and active on-farm educational workshops featuring demonstrations of these important practices and testimonials from farm owners who have had the practices implemented for multiple years. The educational activities will build on already active programs in the participating states, resulting in an improved understanding of the benefits of using annual cover crops in these systems and how the use of mixed species cover crops compares to single species.

Okanogan Conservation District (WA) $306,453
Cover Crops in the Low-Rainfall, Wheat-Fallow Region of Eastern Washington

A large number of producers across the Inland Northwest are interested in integrating cover crops into their winter wheat-summer fallow rotation. Cover crops have been utilized extensively in the Midwest and the eastern United States, where summer precipitation is prevalent, to build soil organic matter, reduce soil temperature and fertility inputs and improve farm sustainability. Because cover crops have not been evaluated in the 8 to 12-inch, non-irrigated rainfall zone, Inland Northwest producers have been hesitant to integrate them into their production systems. Cover crops in the low rainfall regions have the potential to reduce soil moisture and therefore reduce the yields of the successive crop. Following the recent National Forum on Cover Crops and Soil Health, producers became interested in conducting on-farm demonstrations to improve soil health through cover crops. This project will support collaboration with producers to examine the feasibility of planting cover crops in the low-rainfall, non-irrigated wheat-fallow region of Washington. By closely monitoring soil moisture and other parameters, producers will

gain more information and knowledge on the use and feasibility of cover crops in the area and the best way to include cover crops in their rotation.

Oklahoma State University (OK, KS, TX) $872,044
On Farm Soil Health Management Systems Demonstration Program for the Southern Plains

Most of the gains made in the adoption soil health promoting practices have been made as a result of incentive programs and efforts to educator producers on the fundamental principles of no-till system-based management. However, the continued adoption of diverse crop rotations and no-till management in the Southern Plains has been limited by various perceived limitations. This project will focus on a bottom up approach in developing an on-farm demonstration program. In order for this approach to be successful, sufficient support for the demonstration of soil health promoting practices must be provided by producers, county educators, conservation district personnel and NRCS district conservationists. Stakeholders will be asked to identify system based management practices that they think will be useful in improving the productivity and economic viability of soil health promoting practices. State extension specialists will then provide technical assistance in the form of protocols that will result in scientifically sound data collection needed to understand the impact of the practices on yield, yield stability, and the economics of the selected practices. State extension specialists will also develop guidelines for Conservation Stewardship Program enhancements for producers willing to participate in on-farm demonstration projects in order to provide further participation incentives.

Pinchot Institute for Conservation (OR) $125,000
Forest Health-Human Health Initiative Pilot and Replication

Unsustainable forest management and outright loss to development are among the great conservation challenges facing the U.S. Approximately four acres of forest and open space are lost per minute, mostly from family woodland owners. For many their land is their most valuable asset to draw from when sudden financial demands arise. This situation is compounded by the fact that a majority of family woodland owners are older than 65, placing health care at the center of decisions about the family forest. These conditions limit the ability of family forests to deliver sustainable goods and services including the sequestration of atmospheric carbon. Until now forest carbon projects have been mostly implemented by large landowners as a financial mechanism to support conservation and sustainable forest management on their own property. Carbon projects have remained inaccessible to family landowners with contract terms judged too restrictive and credit protocols misaligned with the economics of family ownership. This project will address these issues along with concerns over health related expenses, resulting in the first aggregated (multiple landowners) forest carbon credit transaction in the U.S. to involve family forest landowners in a meaningful way. The project will directly benefit 20 - 25 EQIP eligible landowners on about 3,500 acres in Oregon; setting the stage for broad replication throughout the U.S. through the innovative "conservation for health care" incentive model, family woodland

owners will meet their health related expenses not through timber liquidation or land sale, but by monetizing carbon credits generated through sustainable forestry.

Purdue University (IN) $252,978
Documenting Soil Health Assessment Methods and Jump Starting Carbon and Nutrient Cycles for the Sustainable Restoration of Soil Health

A comparative soil health assessment approach is needed to document the ability of current and proposed soil health test methods to differentiate known healthy soils from “less healthy” soils. A comprehensive evaluation of soil health assessment methods will be made on soil samples collected from fields with a long history of soil and crop management practices that improve soil health (e.g. no-till/never till systems with cover crops) to the same soils collected from fields in close proximity to the healthy soil location, but under more traditional soil and crop management systems (e.g. rotational tillage without cover crops). The high-carbon amendments targeted by the proposed field demonstration project have been previously proven to have positive effects at smaller scales; this project will demonstrate the positive impacts of these amendment applications at an agriculturally relevant scale. Differences in soil health will be quantified by measuring soil physical, chemical, biological properties, soil microbial community structure as well as the Solvita and Haney soil tests. A management protocol that farmers can use to conduct large scale in situ soil rehabilitation on mined lands and other areas where surface soils have been dramatically altered will be developed.

Regents of the University of Minnesota (MN) $190,231
Optimizing Soil Health in Season Extension Environments through Innovative Cover Crop Management

Access to local produce markets in combination with recent cost-share incentives has stimulated a recent and rapid expansion in high-tunnel purchase and utilization. High tunnels, which are unheated plastic-film covered protected field environments with a unique microclimate, allow for crop production in seasons when it would otherwise not be feasible due to low outside temperatures. This is especially valuable in regions such as the upper Midwest, an area challenged by a short growing season and a cold, wet spring. High tunnel growers produce simultaneous crops in the same soil year after year, thus soil quality and fertility can be severely impacted. Management practices that incorporate soil fertility building rotations can increase soil quality in these intensive cropping systems. Legume cover crops are extraordinary sources of organic matter and fertility and, if well managed, can completely replace external nitrogen fertilizer additions, increase soil organic matter, and increase biological functioning in high tunnel soils. The winter months provide a window of opportunity for cover crop rotations, and some high tunnel produces in northern climates are already successfully using cover crops over the winter in their tunnels. This project will increase adoption of winter annual legume cover

crop use in high tunnels by identifying species of interest and transferring evidence-based information to growers, including improvements in both soil quality and cash crop productivity.

Terra Global Capital, LLC (CA, AR, LA, MO, MS) $530,420
Scaling the Supply of Low Emission Rice Offsets through Integration of Field Data that Lowers Verification Costs and Increases Adoption

While the greenhouse gas accounting methodologies and calibration of biochemical models have been developed to support verification of emission reductions from low emission rice practices in the environmental markets, the costs for growers to supply these emission reductions is far too high to promote adoption of these practices and reward growers. The costs to growers to meet the on-going monitoring and verification under market standards is uneconomic due to two reasons; the recurring costs due to the lack of integration of remote/sensor based monitoring data into existing GHG monitoring systems and the insufficient number of farmers currently participating. Simply, with current technology and low level of grower participation, the costs to produce verified emission reductions are greater than the financial benefits provided by environmental markets. These implementation costs can be substantially lowered by aggregating growers within collaborative projects and integrating efficient remote/sensor monitoring methods into the GHG measurement process. This project will address these adoption barriers by expanding an existing Grower Management and Environmental Measurement technology platform to support Mid-South growers and to integrate proven sensor/remote data into to monitoring process to reduce costs of verification.

Texas A&M AgriLife Research (TX) $361,135
Demonstrating Soil Health Promoting Practices to Increase Water Holding Capacity and Yield in Deficit-Irrigated Agriculture

In semi-arid regions of Texas, the impact of cover crops on soil moisture availability is a major concern. These concerns have been partly supported by past research evaluating cover crops in the Texas Rolling Plains and Southern High Plains. A comprehensive evaluation and demonstration of the impact of conservation cropping systems could be the very vehicle that drives a more widespread adoption of soil health promoting practices within semi-arid environments. This is especially important in regions that face water quantity issues, which is evident throughout Texas. In order to increase soil carbon and potentially reduce irrigation water requirements, soil health promoting practices such as conservation tillage, cover crops and crop rotation must be incorporated. With low adoption of soil health promoting practices and regional water supply issues, demonstration of soil health promoting practices are imperative to the success of future producers and conservation of water resources where deficit irrigation is commonly practiced. This project will incorporate crop rotation and mixed species cover crops into long-term conservation tillage systems and demonstrate how soil health promoting practices

can improved water use efficiencies under deficit irrigation without compromising crop yields and/or economic returns.

Texas A&M AgriLife Research (TX) $357,472
Demonstration of Water Purification/Treatment/Recycling and Power Generation with Net Metering in a Commercial-Sized University Dairy Operated by the Dairy Industry

Wastewater and solids manure handling are two of the most important environmental issues confronting animal production facilities in the U.S. Limited technologies are in place to solve the issue of scarce water resources as well as proper handling of manure that could become a resource for the animal facilities. The main goal of this project is to demonstrate a proven water treatment and recycling technology and a biomass conversion system for electrical power. In addition, nutrient loading will be reduced and the wastewater holding structure will simply become a holding pond with reduced solids loading and hence nutrient loading. Several trainings, workshops, field days and demonstration will be organized and implemented through this project leading up to the final demonstration of the combined water treatment and reuse as well as possible net metering of the power generation output.

The Curators of the University of Missouri (MO, IA) $463,167
Building Soil Health through Innovative Cover Crop Practices while Enhancing Pollinator and Wildlife Habitat

Producer interest in cover crops has exploded over the past few years but cover crop acreage is still relatively low. Of the 250 million crop acres in the Mississippi River Basin states, it is estimated that only about 1.5 million of those acres are planted in cover crops. This project will demonstrate the soil health benefits, pollinator diversity and improved wildlife habitat that results from utilizing cover crops and evaluate the economic benefits and values that accrue from implementing these practices. Additional objectives include demonstrating and comparing pollinator species richness and use of cover crops to that of field borders composed of native forbs and legumes throughout the growing season. Outreach, educational activities and publications for EQIP eligible landowners will be developed that promote the use of cover crops and field borders for agronomic, ecological and economic benefits.

The Curators of the University of Missouri (MO, AR) $367,913
Energy Saving Through Waste Heat Recovery in Poultry Barns

Energy (propane) used to maintain a comfortable environment for flocks is the major cost to the poutry production farmer, and given the increasing and unpredictable cost of propane is a significant economic risk for the poultry farmer. This project will verify proven technology for recovering the energy in the ventilation air exiting a poultry production barn via an innovative waste heat recovery system. This heat recovery system accomplishes what has not been successfully done before – operating automatically, labor free, clog-free, and corrosion resistant,

under conditions involving litter, dust and features, because of the programmed self-cleaning system. The system transfers the waste heat from in the exhaust air from poultry house to pre-heat the fresh air on entering the house. The field testing of the system in broiler houses has shown a 40-50 percent reduction of propane consumption. Successful adoption and implementation requires performance verification, manufacturing protocol process development and development of a business plan.

The National Grazing Lands Coalition (TX, LA, SC, NY, ND) $279,720
Utilizing Outreach and Grazing to Improve Conservation and Soil Health

Livestock producers should perceive themselves as a grass farmer and not just a livestock producer. The most successful producers look at themselves a step further, as soil managers. This project will conduct outreach, education and demonstration activities on how prescribed grazing impacts pasture and range productivity, conservation and soil health using rainfall simulators. The use of the rainfall simulator will help historically underserved producers to visualize and comprehend the potential for greater rainfall infiltration and lesser rainfall runoff on grazing lands with a high level of grazing management.

The Pennsylvania State University (PA) $290,650
Vegetative and Riparian Buffers for Environmental Stewardship and Renewable Fuels on Poultry Farms

Commercial poultry and livestock farms supply 95 percent of the meat, eggs and milk the people of this nation consume. However, they are at the threshold of a sustainability crisis. This project will demonstrate and multiply the adoption of five conservation impacts of planting buffers and biomass on these modern commercial farms. Vegetative buffers can scrub exhaust fan emissions of odor, NH3 and particulate matter comprised of fine particle dust, endotoxins and microorganisms, reducing their impact on those working or living near the farm. Riparian buffers can filter nutrients, hormones and bacteria associated with runoff events from barn roofs, access roads and barn yards. Shade and windbreaks can reduce the solar load and winter winds drawing heat from the poultry barns for energy conservation. Biomass crops such as switch and Miscanthus grass, willows and poplar can be grown for bedding materials and the spent litter can be burned replacing fossil fuels utilized in brooding birds and heating animal facilities. And lastly, the screened and landscaped appearance of farms with visually pleasing trees and shrubs can improve the image of these modern high density animal enterprises at the urban-rural interface. The environmental impacts of these conservation practices are highly transferable among the Chesapeake Bay states and the rest of the nation. Environmental assessment indicators for water and air quality show there is potential emissions reduction and contaminant filtration of 28 to 50 percent.

The Regents of the University of California (CA) $228,856
Farming for Native Bees: Phase II

As 30 percent of U.S. food crops depend on honey bee pollination, the implications of ongoing declines are of growing concern, particularly as Colony Collapse Disorder continues to claim over 30 percent of managed honey bee hives per year. Recent research has begun to explore the potential of native bees to supplement pollination services. However, more is needed to quantify the impacts of native bee farming in diverse agricultural systems and regions, identify methods to encourage the best native bees for specific crops and engage farmers in implementation. This project supports an innovative, farmer-initiated effort that aligns with a number of NRCS goals for establishing, monitoring, and evaluating pollinator habitat, and educating and engaging agricultural producers in pollinator conservation.

The University of Tennessee (TN) $339,585
Demonstrating Cost-Effective, Low-Input Grazing Management Systems using Stockpiled Native Forages

In the Southeast, tall-fescue is the primary forage base grazed by cow-calf producers, which means limited forage production during the summer and winter months. Frequent short-term droughts during the summer can result in overgrazed pastures and stand loss. Therefore, many producers in the Mid-South have begun incorporating warm-season grasses into their programs to reduce the impact of drought and overgrazing. During the winter months, cold temperatures result in poor forage growth. Due to their low nutritional quality once dormant, native warm-season grasses (NWSG) are not being utilized during fall and winter grazing in beef production in the Mid-South and Southeast. This lack of expertise in managing beef cattle on low-quality forages leads to only grazing NWSG for approximately 90 days during the summer, resulting in hesitation of landowners to establish and utilize NWSG in their livestock operations. This project will demonstrate and educate producers, farm managers and the general public on the benefits of using NWSGs (i.e., switchgrass and/or indiangrass/big bluestem combo) in a conservative, low-input grazing management program that will extend the grazing season and decrease the need for feeding harvested feedstuffs. Side-by-side demonstrations will be used to monitor cattle performance, forage quality and quantity, soil health and input costs to demonstrate cost-effective and strategic grazing management for livestock producers. Altogether, this demonstration will educate producers on effectively use stockpiled NWSGs in their grazing management plans their livestock operation and production goals while reducing expensive feed costs and improving soil health. This information on management of NWSGs for winter grazing, heifer production and economic implications will be delivered to educators and industry supporters with in-service trainings, directly to beef cattle producers at field days and beef and forage associations, and through a web-based reference library of written materials and videos for easy access and increased audience.

University of Hawaii (HI) $474,043
Promoting the use of Cover Crop Calculator for the Tropics as Nitrogen Management Tool and the use of Cover Crops for Soil Health Management Guideline

Leguminous cover crops can contribute significant amount of nitrogen to crop production. However, farmers need a better tool to accurately estimate the nitrogen contribution from legumes so as to precisely reduce fertilizer rates. A simple calculator to address this issue was developed for Idaho and Oregon with high success rate. This project will expand on this proven technology and modify it for tropical climates and soil types in the Pacific Islands. To make the calculator more precise, variation of nutrient availability when the leguminous cover crops were mixed with graminaceous cover crops or followed by till or no-till cropping systems will also be taken into consideration. The overall goal of this project is to increase the incentive for farmers in Hawaii and the Pacific Islands to adopt cover cropping into their farming systems.

University of Idaho (ID) $65,707
Developing Grazing Guidelines for Fuels Management in Sagebrush Ecosystems: Implications for Wildlife Habitat and Soil Conservation

Sagebrush dominated ecosystems cover vast areas of the West (770,000 square miles), providing habitat for many wildlife species that require sagebrush to complete their lifecycle. Species include the pronghorn antelope, pygmy rabbit, sage thrasher, sage sparrow, Brewer's sparrow, sagebrush lizard and the greater sage-grouse which is proposed for listing under the Endangered Species Act. One of the greatest threats to sagebrush ecosystems is wildland fire which engulfs increasingly large areas of sagebrush converting these shrub-dominated ecosystems to grasslands. Wildland fire in sagebrush ecosystems severely degrades habitat value for sagebrush obligate species and makes areas susceptible to soil erosion and invasion by exotic plants. Land management strategies to reduce the extent and severity of wildfires require integrated and landscape-scale approaches. Targeted livestock grazing is considered a practice that can alter and reduce wildfire fuel loads in sagebrush ecosystems. The time is right to summarize anecdotal evidence, conduct field demonstrations, develop grazing guidelines for fuels management and empower land managers to apply targeted grazing as a tool to reduce the impacts of wildfire on wildlife habitat in sagebrush ecosystems. The anticipated environmental outcome is widespread adaptation and implementation of innovative targeted grazing practices to manage wildfire in sagebrush steppe for wildlife habitat conservation.

University of Montana (MT) $59,997
Enhancing Ecological Site Development through Technology Transfer and Producer Input

Ecological site descriptions (ESDs) describe the ability of a site to produce and support particular types and amounts of vegetation based on soil, climate and topography. State-and-transition models (STMs) describe changes in vegetation and soils within an ecological site in response to management and other factors. Livestock producers and local natural resource staff can play an

important role in the development of STMs because they have knowledge of historic management and other factors potentially impacting plant communities at these sites. This project will incorporate information from local natural resource professionals and livestock producers into STM development. Ecological sites can also act as a valuable framework for assessing wildlife habitat characteristics; however, specific wildlife habitat needs are not currently addressed in ESDs. Birds can serve as useful indicators of ecological sites because they are easily identifiable and frequently monitored. In Montana, several bird species associated with rangeland ecological sites are species of conservation concern (SOC), including greater sage-grouse, Sprague's pipit, and long-billed curlew. The project will link ESDs and STMs with bird habitat requirements, providing an innovative approach to understanding how these tools can be used to guide conservation and management of wildlife species in conjunction with livestock production.

University of Vermont and State Agricultural College (VT, NY) $174,691
Demonstrating Effects of Compaction Best Management Practices on Soil Properties and Water Movement

Soil compaction can be a significant yield-limitation and conservation concern. Compacted soils often result in poor drainage, increased runoff, reduced soil aeration and decreased root penetration and subsequent plant-access to available soil moisture. The compaction problem is common on many farms, especially in cool, humid regions of the country with a relatively short growing season. To remediate deep compaction, producers often employ deep tillage, or subsoiling, in an effort to loosen soil to reduce bulk density and allow for deeper root penetration and improved percolation of soil water. Management practices that involve less soil disturbance, such as cover cropping and no-till, can also help remediate and prevent compaction by improving overall soil health and "bio-drilling." Furthermore, soil moisture status within the soil profile, and its susceptibility to compaction or fracture, is commonly assumed without reliable qualitative or quantitative indicators. Demonstrating user-friendly and inexpensive on-farm soil moisture monitoring, and its meaningfulness to compaction prevention, is needed by farmers working to improve soil health. This project will demonstrate how soil health, and specifically structure, available water capacity, and ability to transmit water, are influenced by management practices intended to alleviate compaction.

University of Vermont and State Agricultural College (VT, NY) $483,484
Innovative Strategies for Broad Scale Adoption of Cover Cropping in Northern Climates

Although the integration of row crops into cropping systems has increased productivity and efficiency, lack of rotation out of annual crops has led to a number of potentially detrimental economic and environmental consequences, ranging from increased use of pesticides, increased cost of production, decreased yields, rapid erosion of topsoil and reduced soil health. Cover cropping can have a tremendous impact on water quality and environmental quality as a whole.

However, in northern regions, row crops are harvested too late to establish many of the cover crop species. Interestingly, all cover crop mixtures developed for the Northeast (PA, western NY) are not suitable for more northern regions such as VT, ME and eastern NY. Mixtures of cover crop species for the far north need to be developed and deployed. Interseeding in mid- to late summer might establish a diverse cover crop mixture in northern regions by allowing the cover crop species more time to establish and grow prior to winter months. This project will develop, evaluate and verify innovative cover cropping strategies such as cover crop mixtures, interseeding techniques, and seeding rate guidelines that will help maintain and improve soil productivity in Northern regions.

Utah State University (MN) $123,763
Coupled Human-Biophysical Framework to Predict Conservation Effectiveness

Agricultural productivity and environmental quality are threatened by poor targeting and implementation of Best Management Practices (BMPs), which may unnecessarily take land out of production and reduce social and environmental benefits gained from conservation practices. Significant progress on reducing non-point sediment and nutrient pollution has been hindered by low BMP adoption rates, limited maintenance and poor performance in some settings. This project combines high-resolution, process-based bio-physical modeling with individual-agent socio-economic modeling to evaluate optimal combinations of site-specific BMPs at the watershed scale to enhance BMP adoption and effectiveness, while not compromising agricultural productivity and water quality. The primary goal will be evaluation of sociological, economic and bio-physical barriers to BMP adoption and maintenance at the watershed scale, focusing specifically on USDA priorities of: barriers to BMP adoption; bundling conservation measures; watershed-scale impacts of conservation practices and agricultural wetland mitigation banks. Outreach efforts will involve communicating directly with producers and state and local agency staff via surveys, interviews, presentations and a project website that will synthesize results and provide a mechanism for direct feedback from producers, agency staff and other stakeholders.

Virginia Polytechnic Institute and State University (VA) $381,761
Quantifying Soil Health: Measuring the Impacts of Tillage and Cover Crop Practices on Nutrient Retention and Soil Physical, Biological and Chemical Properties

Modern agricultural practices, such as monoculture cropping systems and mechanized tillage, have resulted in widespread soil degradation, erosion and biodiversity loss. The resultant degraded, “unhealthy” soils require increased inputs such as fertilizers and irrigation in order to maintain productivity. In recent years, however, proactive agricultural producers, extension agents and agencies have worked together to develop management methods such as cover cropping and conservation tillage that restore, maintain or improve the health of agricultural soils, thus reducing production inputs and improving soil properties. The overall objective is to

increase the acreage of land that is being managed with conservation tillage including no-till and multi-species high-residue cover crops, by demonstrating and quantifying the physical, chemical and biological properties of soils managed under conventional tillage, conservation tillage and conservation tillage with high-residue multispecies cover crops. This project will incorporate several innovative strategies to increase the awareness and practice of soil health management tactics, building on a legacy of interrelated investigation, outreach and extension.

West Virginia Conservation Agency (WV) $15,000

Using In-Season Cover Crops to Improve Soil Health and Reduce Nitrogen Fertilizer use in the Chesapeake Bay Drainage

Nitrogen is an essential plant nutrient and a significant source of water quality impairment. The Chesapeake Bay is an estuary impaired with excess nitrogen, phosphorus and sediment. This project will develop a series of demonstration plots and education and outreach opportunities to elevate producer participation in no-till, cover cropping and environmental stewardship programs. The focus will be on intercropping legumes with com as an in season cover crop (living mulch). A successful demonstration of the concept is the first step to implementation. These demonstration plots will serve as living examples of the power of cover cropping and conservation. To highlight the benefit of these innovative techniques, state of the art soil testing technologies will be used to monitor soil quality and nutrient status. The data coupled with real demonstration plots for producers to examine will lay the groundwork for the next generation of best management practice development and innovation. The lessons learned from these demonstration plots will be used to develop new West Virginia Best Management Practices and set the stage for a brighter more environmentally sound future for agriculture.

Western Riverside County Agriculture Coalition (CA) $200,000

Developing and Piloting a Water Quality Trading (WQT) Program for Agricultural Operators in the San Jacinto River Watershed

A water quality trading (WQT) feasibility assessment was recently completed for agricultural operators in the San Jacinto River Basin as a tool to implement the Lake Elsinore/Canyon Lake nutrient total maximum daily load (TMDL). The final WQT feasibility assessment concluded that farmers will benefit from trading to meet allowable nutrient loads assigned to agricultural sources through the TMDL, with additional demand generated through Conditional Waiver for Agricultural Dischargers requirements. There now is a need to develop a nonpoint source-to-nonpoint source WQT program for agricultural operators in the San Jacinto River watershed and pilot such a program. This project seeks to develop and pilot WQT program rules and infrastructure to support nonpoint source-to-nonpoint source trading in the San Jacinto River watershed using a stakeholder-based approach. The objectives are to facilitate key stakeholders through the WQT program design phase and to test the WQT program's ability to effect quantifiable load reduction goals, with the ultimate goal of implementing the WQT program in

high priority areas to help achieve the TMDL nutrient load reductions and provide new tools to support other nonpoint source-to-nonpoint source WQT approaches across the country.

Wetland Dynamics, LLC (CO) $60,000

A New Technology for Threatened and Endangered Species Monitoring in the San Luis Valley of Colorado: Remote, Passive, Acoustic Monitoring for Southwestern Willow Flycatcher, Yellow-billed Cuckoo and Northern Leopard Frogs

Traditional bird or amphibian surveys typically require one or more observers in the field to document birds by sight or vocalization. A number of factors associated with different methods can result in negative impact to a species and poor monitoring results. With acoustic monitoring a species can be monitored for days or weeks with disturbance limited to brief visits to the site to set up and retrieve the recordings. The data are collected at all sites in the same way removing all observer bias or influences of inclement weather. The potential bias associated with data analysis is eliminated because recordings are scanned on a computer with the same recognizer. This technology has proven to be extremely effective for determination of presence or absence of specific wildlife species (bats and marine mammals) without the intrusion or influence of humans in the area. This project will utilize the technology of acoustic monitoring by developing, testing and refining recognizers to improve monitoring of threatened and endangered species in the San Luis Valley. Acoustic monitors will be deployed to detect breeding populations, focus habitat improvement measures and measure success of treatments by the presence or absence of these species in locations that have baseline conditions documented through matching funds.

Willamette Partnership (OR) $437,305

Integrating the Science, Policy and Tools for Floodplain Markets and Incentives

Floodplains are a source of critical ecosystem services, including flood storage, improved water quality, fish and wildlife habitat, open space and groundwater recharge. They are also a nexus of regulatory and economic pressures. This project will take the best available science, combined with policy innovations, to create a package that communities and producers can use to better manage floodplains, including market-based incentives. The Nature Conservancy has built Floodplains by Design, a tool for urban floodplain planning that the City of Portland has effectively implemented in several areas, and that could be adapted to prioritize floodplain restoration opportunities on working lands. The Freshwater Trust is building tools to quantify nutrient and temperature reduction from floodplain restoration on farms, which can be adapted and supplemented with habitat and other metrics to inform local comprehensive planning. Willamette Partnership has built tools to assessment habitat functions with U.S. EPA and U.S. Army Corps of Engineers that can be adapted to streamline permitting for floodplain conservation practices with farmers and cities. Those same tools can also be used to help farmers and conservation practitioners communicate how restoration benefits their neighbors in cities and

can help cities communicate how their practices benefit agriculture downstream. This project will also help NRCS better leverage investments through the Wetland Reserve Program, Floodplain Easement Program, Environmental Incentives Quality Program and other initiatives by coordinating with local, city and county planning agencies and state natural resource agencies to target investments, quantify outcomes and create additional incentives for landowners to participate in these programs and contribute to floodplain health.

Winneshiek Energy District (IA) $408,692
Energizing Agriculture: An Innovative and Transferable Approach to Agricultural Energy

Winneshiek Energy District has built its local model of energy planning on the conservation planning process of locally-led Soil and Water Conservation District/NRCS partnership. In the energy industry, unfortunately, energy audits have become the norm, and financial assistance expected. Audits, however, are typically a program-driven product that rarely creates change, while locally-led energy planning is a customer-driven process with high success rates even without financial assistance. Like conservation planning, energy planning takes a strong local partnership to create the acceptance and critical mass necessary for widespread adoption. The Energy District will establish an agricultural energy planning program and regional mobilization initiative with partners including the SWCDs, NRCS, ISU Extension, producer groups, utilities and more. This project will build a locally-led energy planning model, demonstrate implementation success through energy planning leading to completion of at least 30 projects – 20 including renewable energy systems – and develop tools and conduct technology transfer and replication activities together with NRCS.

Winrock International Institute of Agricultural Development (MN, IA) $395,930
Demonstrating Economic and Soil Health Benefits of Livestock Grazing on Cover Crops

Individual farmers have experimented with rotational livestock grazing on cover crops across the country, primarily as a means of improving their financial bottom line. The economic gain associated with this innovative enterprise stacking is estimated at $66 per acre, a figure that does not account for productivity gain or reduced nutrient inputs. Combining rotational grazing and multi-species cover crops also significantly build soil health, increases water infiltration, reduces erosion and increases the productive capacity of the land. This project will establish and monitor approximately 50-acre, side-by-side control and treatment plots within corn fields on eight farms. Demonstrations will span two full years of cropping/cover cropping. Current management practices will be maintained on control plots. On treatment plots, the project team will work with farmers, first to introduce multi-species cover crops and then to strategically release and rotate cattle across the plot, which will graze down and trample the cover. Detailed profit and loss data and soil health and fertility measures on each pair of plots will be collected. All existing analyses indicate this practice will generate more direct revenue than it costs to establish. Over time it will re-build soil health, reducing the need for nutrient inputs, decreasing flooding and erosion,

increasing drought tolerance, and ultimately, increasing crop and livestock yields and revenue from a single land base.