

Project: 9

Agency: Oklahoma Conservation Commission

Title: Honey Creek Watershed Implementation Project

INTRODUCTION:

Project Location:

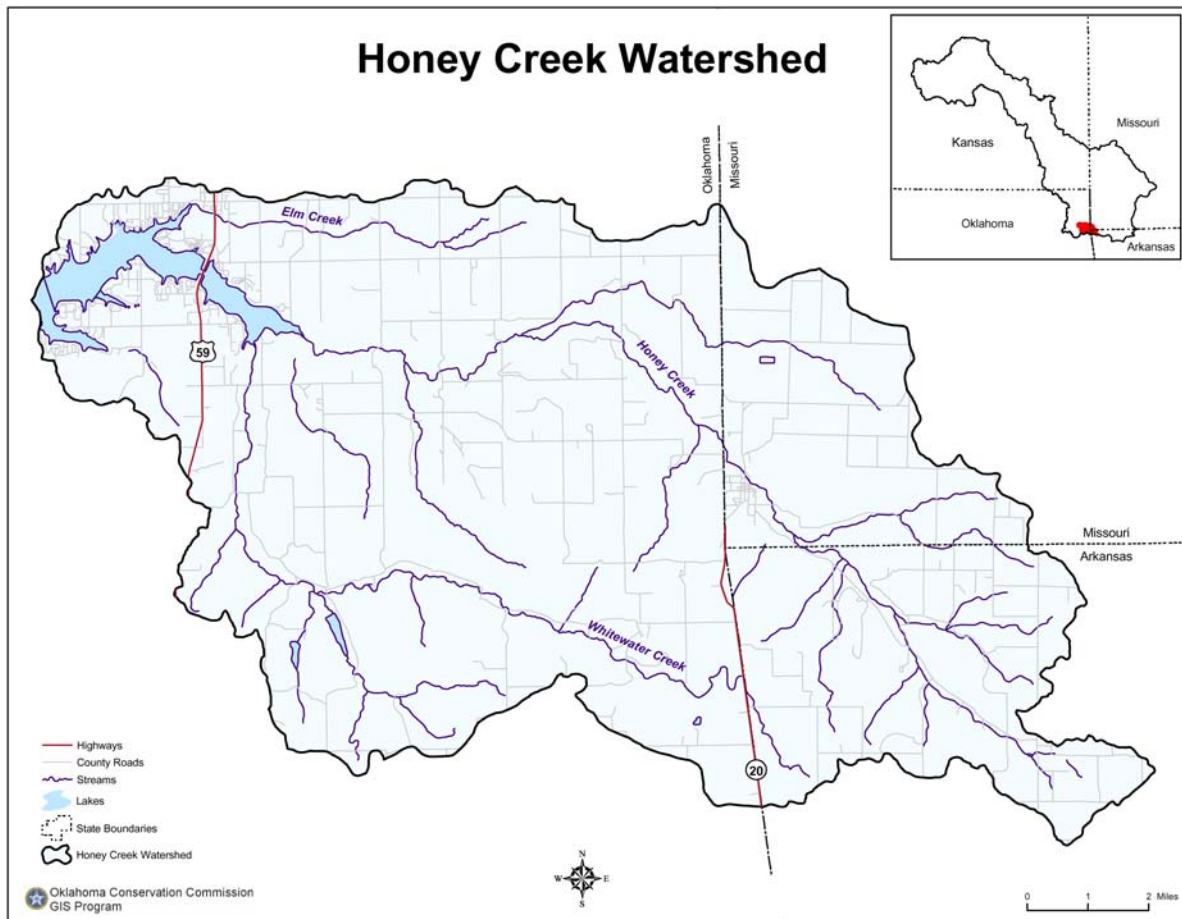


Figure 1. Location of the Honey Creek Watershed.

Honey Creek is located in the Ozark Highlands and Central Irregular Plains Ecoregions in northeastern Oklahoma, southwestern Missouri, and northeastern Arkansas. Approximately seventy percent of the watershed is located in Oklahoma.

Problem Statement¹

The Honey Creek Watershed is located in a poultry and cattle producing area. As a subwatershed of the Grand Lake Watershed that includes an arm of the lake, Honey Creek is also affected by NPS pollution from residential and development sources. Honey Creek and Grand Lake are of concern because along with a tributary to Honey Creek (Cave Springs Branch), both are listed on the Oklahoma 2002 Integrated Report Category V list for pathogens, low dissolved oxygen, sulfate, TDS, chloride, and unknown causes (based on poor fish collection) (Table 1). In addition, its pollution problems are typical of agricultural areas of northeastern Oklahoma. The 2002 OWRB BUMP report has stated that Grand Lake is impaired by turbidity and TSI for chlorophyll-a collected during the growing season indicates that the lake is hypereutrophic.

Table 1. 2002 303(d) Listed Causes of Impairment in Honey Creek Watershed.

OK Waterbody ID	Name	Cause of Impairment
OK121600030320	Whitewater Creek	Low dissolved oxygen
OK121600030340	Cave Springs Branch of Honey Creek	Cause unknown, chloride, pathogens, sulfates, TDS
OK 121600030445	Honey Creek	pathogens

Many streams and lakes in this area are threatened or impaired by nutrients. Riparian areas in this region are frequently compromised, either through removal of protective vegetation or through uncontrolled access by livestock. The result is streambank erosion, habitat loss, and increased sediment transport in streams. As a tributary to and a major cove on Grand Lake, significant residential development has also occurred in the Honey Creek watershed.

Eutrophication, manifested in low dissolved oxygen and sometimes hypereutrophic algae growth is due to elevated nutrient loading. The 1995 Grand Lake Clean Lakes Study determined that the lake was eutrophic and experiencing nuisance algal blooms in certain areas. The study also determined that phosphorus was the limiting nutrient in the system. The phosphorus in Honey Creek likely originates both from nonpoint source pollution resulting from agricultural practices and residential development and point sources in the watershed.

Another indication of possible nonpoint source contamination and impacts from animal waste is suggested by the elevated levels of bacteria found in Honey Creek. A 1999-2000 USGS reconnaissance study in the Cave Springs Branch watershed of Honey Creek found that bacteria in groundwater and surface water in the basin were from bird, cow, horse, dog, deer, and human sources. Sampling at the state line suggested that much of the bacteria were from cows and horses. Sampling in well water indicated human and dog feces as bacteria sources, suggesting that onsite wastewater treatment may not always be adequate in the region's highly permeable soils.

¹ This section contains information specific to components (a) and (b) of a watershed based plan, specific to the Honey Creek subwatershed of Grand Lake. Further information on causes, sources, and goals can be found in the Grand Lake Watershed Based Plan.

Groundwater sampling for nitrogen suggested nitrogen sources other than Cave Springs Branch, indicating that animal waste, fertilizer, or human waste is likely contributing to high levels in groundwater. Surface water sampling suggested that the poultry processing plant on Cave Springs Branch contributes significantly to nitrogen² loading in the watershed.

Landuse in the watershed is primarily pasture (57% of total) or forested (33%), followed by cropland (7%). As depicted in the landuse map (Figure 2) and table 3, much of the streams run through pasturelands that appear to lack protected riparian zones. Approximately seventy percent of stream miles in the watershed in Oklahoma and seventy eight percent of miles in the total watershed run through pastureland.

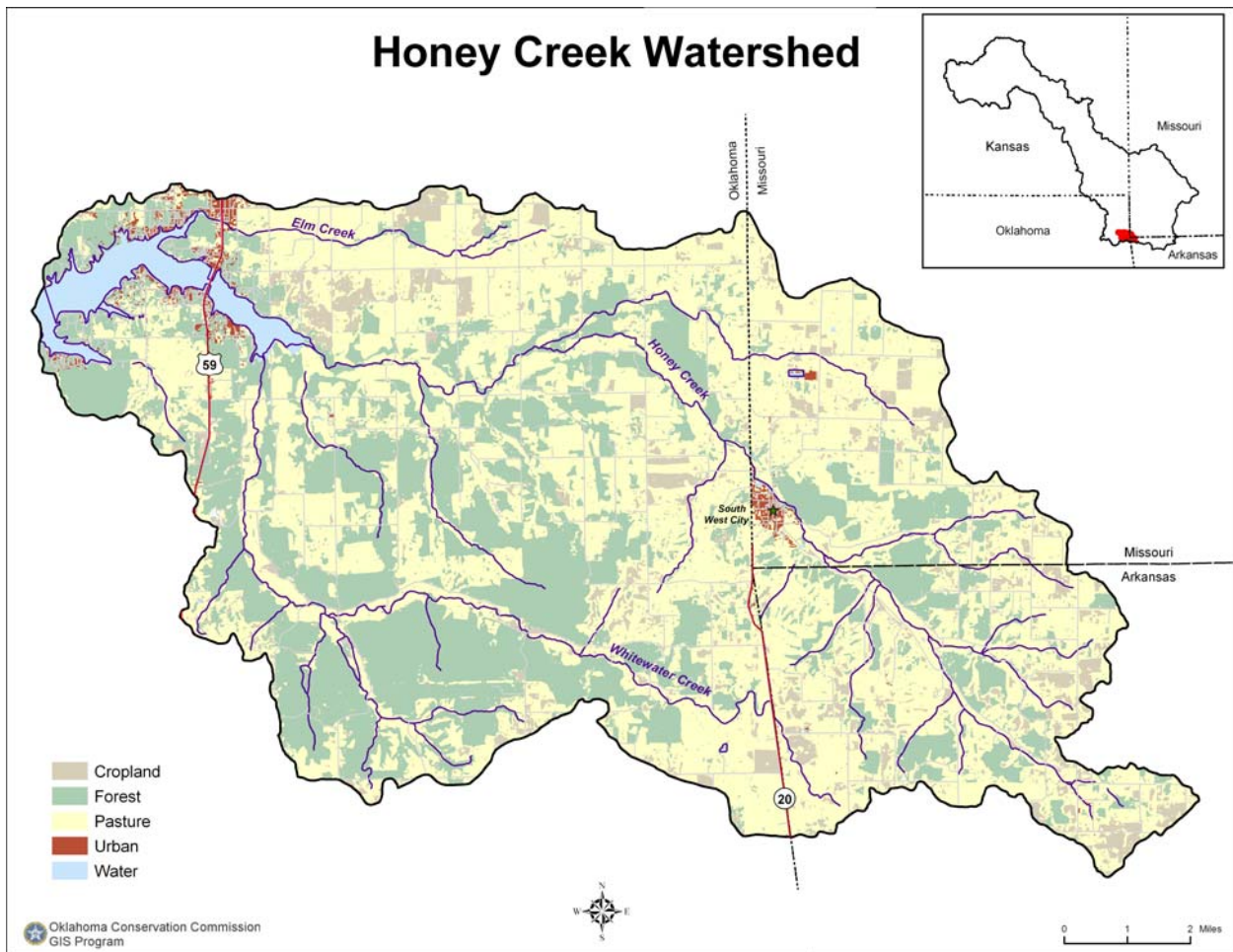


Figure 2. Land use in the Honey Creek Watershed.

² The USGS study did not sample for phosphorus; however, additional sampling conducted by the ODEQ suggests that the poultry processing plant also contributes significantly to the phosphorus loading in Cave Springs Branch and Honey Creek.

Table 2. Landuse Distribution in the Watershed.

	Oklahoma Landuse		Outside OK Landuse		Total Landuse	
	Acres	% of Total	acres	% of Total	acres	% of Total
Bare Rock/Sand/Clay	15.50	0.03	5.63	0.02	21.13	0.03
Cropland	3,138.65	5.77	2,617.74	10.85	5,756.39	7.33
Forest	20,973.28	38.55	4,556.30	18.88	25,529.58	32.51
Open Water	1,810.77	3.32	51.79	0.21	1,862.56	2.37
Pasture	27,872.12	51.23	16,707.52	69.25	44,579.64	56.76
Quarries/Strip Mines/Gravel Pits	9.68	0.02	0	0	9.68	0.01
Transitional	5.52	0.01	1.02	0.01	6.54	0.01
Urban	583.45	1.07	188.01	0.78	771.46	0.98
Total	54,408.97	69.28	24,128.01	30.72	78,536.98	

Table 3. Landuse along Stream Channels in the Watershed.

	Oklahoma		Outside OK		Total Watershed	
		% of Total		% of Total		% of Total
Watershed acres	54,408.97	69.28	24,128.01	30.72	78,536.98	
Stream length (miles)	89.84	70.04	37.71	29.96	127.55	
Cropland Stream miles	0	0	18.44	2.64	2.64	2.07
Pasture stream miles	62.89	70.00	37.20	32.05	100.09	78.71

This distribution of landuse throughout the watershed and along stream channels suggests that a significant portion of NPS-derived loading of sediment, nutrients, and pathogens originates in the pastureland of the watershed. In addition, the USGS study suggested that septic tanks also contribute to the nutrients and pathogen loads in the watershed.

NPS-derived phosphorus loading to Honey Creek can be estimated using the unit area loadings from the Honey Creek area predicted through the 1995 Grand Lake Basin Management Plan report (OCC 1995). These estimates (Table 4) also suggest the highest load to the watershed is derived from pastureland. These values may underestimate the loading from urban and residential development (primarily in forested areas of the watershed) because significant development has occurred in the watershed since the 1995 report.

Table 4. NPS Phosphorus Loading to Honey Creek.

	Annual P Load in Oklahoma (kg/yr)	Annual P Load from outside OK	Total Annual P Load to Honey Creek
Cropland	1,144	954	2,098
Pasture	3,106	1,861	4,967
Urban	52	17	69

Forest	1,868	406	2,274
Total	6,170	3,238	9,408
% of Total Load	66%	34%	

The 2004 Draft Watershed Based Plan establishes an initial load reduction goal for phosphorus, sediment, and fecal bacteria of 20% within five years, working towards an ultimate goal of an 80% reduction in phosphorus and sediment, and at least a 50% reduction in fecal bacteria. To reach those goals, phosphorus loading in Honey Creek would need to drop to approximately 7,526 kg P/year within five years, and ultimately 1,881 kg P/year³.

The OCC developed an education project in the Grand Lake Watershed as part of the FY 2004 Program. That project (Phase I) will focus on monitoring, planning, demonstration and education that will compliment the efforts already ongoing in the watershed and those planned for projects such as this FY 2005/2006 project. This FY 2005/2006 project will build on the foundation of the FY 2004 project to demonstrate practices to reduce NPS pollution in the watershed. Both projects will focus on water quality problems associated with eutrophication including sediment, nutrients, and fecal bacteria.

Objective:

A Watershed Based Plan (WBP) has been drafted for the Oklahoma portion of the Grand Lake Watershed. A series of Total Maximum Daily Loads (TMDLs) are in the early stages of development. The TMDLs and future evolutions of the WBP may further define the water quality problems and identify additional measures needed to achieve water quality improvements in the Honey Creek Watershed. This project will focus on the nonpoint source (NPS) water quality problems identified to date. Agricultural and residential development activities appear to be the major NPS sources of impact and therefore this program will focus on these activities. The activities in this work program will become major components of future evolutions of the WBP, which has been modified from the WRAS, and will be revisited once the TMDL or other major activities in the watershed are complete.

Based on the knowledge gained through similar watersheds in this portion of the State, the objective of this project is to initiate a watershed scale effort to reduce NPS loading and eliminate threats and impairments to the Honey Creek Watershed. In accomplishing this goal, loadings as established in the future TMDL and Water Quality Standards will eventually be met. The education, implementation, and monitoring activities outlined in this work plan are only the first step in what should be a long-term effort to achieve the objective.

³ Contains information relative to components (a) and (b) of a Watershed Based Plan, specifically for Honey Creek. Further information can be found in the Grand Lake Watershed Based Plan.

Overview:

This project will be managed by the OCC with oversight from the Office of the Secretary of Environment. Gayle Bartholomew, OCC's Environmental Project Coordinator will be the overall Project Manager although completion of individual tasks will be the responsibility of various individuals as detailed later. The project activities will be conducted within a four-year period, beginning in October, 2006 and ending in September 2010. Certain activities may be contracted out to insure completion of a quality product in a timely, cost effective manner. Further discussion of the project overview is detailed under each project task.

This project was developed based on the nine key components of a watershed based plan. Although not all components of the WBP are addressed specifically in the workplan, it was developed to explain how the Grand Lake Watershed Based Plan would be implemented in the Honey Creek subwatershed of Grand Lake. Where possible, footnotes identify sections where WBP components specific to Honey Creek are addressed. Other cases, such as components (f) and (g), a schedule for implementation and interim milestones specific to this project, are found throughout the workplan. Additional components not referenced fully in this workplan are contained in the Grand Lake Watershed Based Plan.

Project Tasks:

Task 9.1. Targeting Nonpoint Source Pollution⁴

Task Description: The Honey Creek watershed covers about 79,000 acres in northeastern Oklahoma, southwestern Missouri, and southwestern Arkansas. Past studies have identified causes of impairment and suggested possible sources, but little has been done to pinpoint the location or concentration of those sources or to verify whether or not certain land uses and potential sources contribute to the problem.

Available resources are inadequate to blanket the entire watershed with best management practices to reduce NPS pollution from all sources. Therefore, the program will focus practices, selecting areas where they are needed the most and where the environmental benefit will be maximized. OCC will utilize a two-step targeting process, the first of which has been funded under the FY 2004 program for this effort. The FY 2004 effort will include results specific to the Honey Creek watershed.

Task Objective: The objective of this task is to define the method used to target resources at the most significant sources and in the most cost-effective manner in the Honey Creek watershed. Completion of this task will also identify, more specifically, the critical areas of the watershed in which measures must be implemented to reduce NPS pollution, or a portion of component (c) of a watershed based plan.

⁴ Completion of targeting under the FY 2004 grant will further address the second portion of component (c) of a Watershed Based Plan more specifically for the Honey Creek subwatershed, by identifying critical areas for implementation.

Task Activities: The result of the first stage of the targeting effort will be a detailed map of areas in the Honey Creek Watershed most likely producing the greatest nutrient and sediment loading. In addition, estimated loadings from subwatersheds in the Honey Creek watershed will be provided in both a map and tabular form such that the greatest contributing subwatersheds can be targeted first by the Project Coordinator. This will suggest areas of the watershed where the most efficient load reduction can be accomplished.

The second stage will build off of the first in that OCC will use the results to develop a targeting/ranking mechanism such as the one used for the USDA NRCS EQIP Program. The first stage targeting will identify critical areas of the watershed, along with subwatersheds where the greatest loading seems to be derived. Beginning with the subwatersheds contributing most significantly to the loading, individuals who live in a critical area will be contacted by OCC and conservation districts and strongly encouraged to participate in the program. This contact will be in the form of phone calls, site visits, and other means to insure that one-on-one contact is made with individual landowners. Those who are interested will receive a preliminary site visit from our Project Coordinator.

During the preliminary visit, the Coordinator will do an investigation as to the extent to which the particular landowner contributes to the water quality problems in the watershed (develop a conservation plan) and assign a ranking index based on the practices that would need to be implemented, the cost for implementation, and the expected impact on water quality improvement. Those with the highest rankings will be funded first, followed by those with lower rankings. In this manner, we will be able to effectively target those areas where we will receive the greatest water quality benefit for each dollar spent. Individuals willing to implement all the recommended practices will receive considerably higher rankings than individuals who are only interested in some of the recommended practices. In other words, landowners cannot pick and choose which practices they want to implement but rather will have to address all the recommendations of the plan. In addition, an accounting of landowners in critical areas who are unwilling to participate in the program will be made, along with reasons for their lack of participation.

Targeting efforts will be coordinated with the local NRCS office that is actively assisting with the program. The purpose of this coordination includes leveraging of funds to our mutual benefit. If it is determined that an individual does not meet our particular needs for this program, they may still be suited to enroll in one of the many USDA programs. For example, EQIP provides funding for many practices that the 319 program will not. If a landowner cannot participate in 319, then they may choose to pursue an EQIP contract. In this fashion, both agencies will benefit from the relationship and work towards our mutual goals. Targeting results will also be shared with NRCS offices and Conservation Districts in the watershed outside of Oklahoma, although implementation through this project will focus in the Oklahoma portion of the watershed.

Part one of the targeting (GIS targeting) will be contracted out to an organization such as the Oklahoma State University Department of Biosystems and Agricultural Engineering with previous experience conducting similar exercises as part of the FY 2004 project and therefore will not be funded under this project. The OCC Honey Creek Project Coordinator will conduct part two of the targeting.

The Environmental Project Coordinator (Gayle Bartholomew, funded annually under the implementation task of OCC Implementation of NPS Management Program Projects such as FY 2005/2006 Project 6) will be responsible for insuring that the targeting contractors remain on schedule and that reports and tasks are completed in a timely manner.

Task Schedule:

Subtask #	Milestone Description	Completion Date
9.1.1	Receive results of first stage from contractor in report form	July 2006*
9.1.2	Meet with Conservation District to discuss results of first stage	July 2006*
9.1.3	Develop second-stage targeting mechanism for implementation summarized in a pre-implementation report. Pre-implementation report will be updated following completion of cooperators sign-up periods to estimate load reductions that should result from the implementation. These load reductions will be specified on a subwatershed level, as well as for the entire Honey Creek watershed.	December 2006

* No funding for these tasks is provided with this workplan

Deliverables:

Subtask #	Deliverable	Due Date
9.1.1	First Stage Targeting Results	July 2006
9.1.3	Pre-implementation report	December 2006

Task 9.2. Project Local Management⁵.

Task Description: Task two involves employing a Project Coordinator and establishing a Watershed Advisory Group. The Project Coordinator will coordinate the planning

⁵ Provides information about the level of technical support (component (d) of a Watershed Based Plan) for implementation of BMPs in Honey Creek. These numbers, divided by four (approximately \$60,000), would be an estimate of a minimum annual amount of technical support necessary to implement components of the Grand Lake Watershed Based Plan in Honey Creek. This section also partially addresses component (e) of a WBP.

effort on water quality issues in the Honey Creek Watershed and write conservation plans⁶. The coordinator will also work with the various groups in the watershed to reduce duplication of efforts. The coordinator will be responsible for the tasks listed below.

- Identify landowners in need of conservation plans and write conservation plans to address NPS-related water quality problems based on the results of stage one targeting. These plans will include animal waste plans and nutrient management plans, as necessary. Residential landowners who live within the targeted area will also be encouraged to participate.
- Coordinate the Watershed Advisory Group (WAG).
- Coordinate planning efforts with NRCS, Conservation Districts, and other groups as necessary. Participate in the team that drafts the necessary plans based on stage two targeting.
- In coordination with the education coordinator (FY 2004 Project 5), assist with local citizen meetings in the watershed on water quality issues.
- Represent the Project Interests at Conservation District Board Meetings.
- Cooperate with NRCS to insure that water quality concerns are addressed.
- In coordination with the education coordinator, hold periodic meetings with the various groups working in the watershed. In particular, meetings will be held with the OSU personnel and others associated with the FY 2004 project to insure coordination of efforts.
- Participate in the educational programs in the watershed.
- Compile photographs of implementation/demonstration sites, before and after implementation
- Review landowner progress in meeting contracted goals.

The Coordinator's position is a full time position, with duration of four years from October 2006 through September 2010.

The Watershed Advisory Group will be made up of local citizens from the Grand Lake watershed, representing each of the major stakeholder groups such as lakeside residents, cattlemen, poultry growers, etc. The WAG will represent the best interests of the watershed to recommend the practices and cost-share rates that will be offered through this program.

The Delaware County Conservation District will provide substantial support for the implementation of this project. The District will provide clerical support for the demonstration program and participate in the educational activities. The District will also provide office and telephone service for the project staff. Support will be provided to the participating district to help offset the office space, telephone, and clerical

⁶ Conservation plans or Farm plans are documents that describe the current landuses on a parcel of property and recommend best management practices to reduce pollutants from those landuses. These may or may not include animal waste plans (documents that describe BMPs necessary to reduce the impacts from animal waste produced on the property) and/or nutrient management plans (documents that describe practices necessary to reduce nutrient runoff from the site).

workload costs. The Conservation District will also recommend potential WAG members to the OCC.

Task Objective: The objective of this task is to insure localized project input and management.

Task Schedule:

Subtask #	Description	Milestones
9.2.1	Establish district support agreements	October 2006
9.2.2	Hire Project Coordinator	October 2006
9.2.3	Select a WAG and hold first meeting	November 2006

Task 9.2 Deliverables

Subtask #	Description	Due Date
9.2.3	WAG and Conservation District Meeting Minutes and Agendas	With final report

Task 9.2 Budget:

Position	Salary	Fringe	Travel	Contractual	Supplies
On-site Coordinator*	\$152,000.00	\$52,000.00	6,000.00	Lease Vehicle \$24,000.00	\$22,000.00
District support agreements				\$20,000.00	

* Position not included nor funded in FY 2005/2006 319(h) Projects 6 - 8.

Task 9.3. Demonstrate Practices and Achievable Water Quality Improvements

Task 9.3.1 Watershed-Based Plan

A Watershed-Based Plan (WBP), addressing the nine key elements identified in FY 2004 319 guidance has been developed for the Oklahoma portion of the Grand Lake Watershed. *The Nonpoint Source Program and Grants Guidelines for States and Territories for FY 2004 and Beyond* requires a Watershed-Based Plan (WBP) to be completed prior to implementation using incremental funds. The WBP is intended to be an evolving document, revised upon completion of major efforts in the watershed. The WBP will continue to evolve, as the TMDL is completed, and as results of the first phase of activities in the watershed reveal whether or not further implementation is necessary to achieve beneficial use support.

As a component of the WBP, specific areas in the Honey Creek Watershed will be targeted for demonstration of Best Management Practices that can reduce NPS loads related to nutrients (primarily phosphorus), sediment, and fecal bacteria. The location of these critical areas will be selected through the methodology described in Task 9.1. The practices that will be promoted will focus on: 1) implementing the reduction goal for nutrient loading to Honey Creek in accord with the initial goals specified in the

watershed based plan (phosphorus, sediment, and fecal bacteria load reductions of 20%⁷ within five years, and ultimately 80% for phosphorus and sediment and 50% for bacteria, and 2) implementing additional objectives of the Watershed-Based Plan. Best Management Practices will also be promoted that will reduce pollutants from the sources identified in Oklahoma's Integrated Report and pollutants identified by recent monitoring programs.

Project Conservation Plans and agreements will be developed by the OCC and implemented by the Conservation District and NRCS representatives. Following the development of these plans and agreements, an appendix to the Watershed-Based Plan will be drafted that will detail the location and nature of practices planned for the watershed and to fine-tune the estimate of load reduction potential from those practices

The TMDL may identify additional needs for implementation in the watershed. Those needs will be incorporated into the WBP and the implementation program as soon as possible. TMDL completion may require that this incorporation occurs beyond the life of this project. However, because the information used in the targeting is the same that will go into the development of the TMDL, any activities of this project will work towards the ultimate goal of the TMDL. Additional funds from future 319 programs may be directed to the watershed if the need is justified.

Task 9.3.2 BMP Demonstration⁸

This sub-task describes the implementation of practices projected for the Honey Creek Watershed. The main BMPs that will be implemented in the demonstration area will focus on reduction of nutrient loads. A Watershed Advisory Group will be assembled to suggest practices and cost-share rates. Examples of practices that will be suggested to the WAG include (1) riparian establishment to include fencing, vegetative establishment, off-site watering, livestock shelters and incentive payments; (2) buffers zone establishment to include fencing and incentive payments; (3) streambank stabilization to include fencing and vegetative plantings; (4) animal waste storage facilities and/or composters; (5) pasture establishment; (6) pasture management; (7) proper waste utilization for poultry producers, (8) heavy use areas, (9) nutrient management, (10) bio-retention cells, and (11) on-site wastewater systems (septic systems).

Application of these practices with similar rates of adoption that occurred in the Beaty Creek FY 1998 – 2000 319 projects allowed an estimate of the potential load reduction

⁷ This project will be portion of the effort working towards a 20% load reduction goal for the watershed within the four year period. Additional efforts such as point source reductions, adoption of BMPs through USDA programs, and other load reduction efforts will be necessary to meet this goal for the watershed within a four year period.

⁸ Describes elements of components (b) and (c) of a Watershed Based Plan more specifically for the Honey Creek subwatershed, by identifying the practices that will be used to reduce NPS pollution in the watershed and the load reduction that could be accomplished with predicted levels of implementation. More information can be found in the Grand Lake Watershed Based Plan.

that might be accomplished from these implementation efforts using the PRedICT model. PRedICT estimated that this implementation, directed at cropland and pastureland (particularly those along streams) and residential development could result in a phosphorus load reduction of over seventeen percent.

Oversight of implementation will be the responsibility of the Delaware County Conservation District, with the assistance of the OCC staff including the Project Coordinator. The OCC staff will draft the farm plans and agreements between the landowner and conservation district to implement approved practices. Distribution of funds will follow the pattern established with previous projects.

Demonstration will occur on cooperator farms, residences, or commercial properties. These landowners, selected through the targeting practices delineated earlier, will implement practices on a cost-share basis. This mechanism will occur much in the same way as in other priority watershed projects.

Demonstration of the success of these practices should help spread the efforts to remaining parts of the watershed. The conservation district, using the locally led State cost-share program, will glean information from the project on the Best Management Practices that will reduce nutrient loading to the streams in the Honey Creek Watershed.

A detailed plan for the initial phase of implementation (pre-implementation report) will be appended to the finalized Watershed-Based Plan, once the initial signup period is complete. This plan will detail the location of needs, the location of the initial cooperators, and the initial planned practices. This plan will also evaluate, on a subwatershed level, the load reduction likely to result from the planned practices. It is likely that not all producers in the critical areas will be willing or able to participate initially in the project. This implementation plan will allow project planners to evaluate the completeness of the initial effort and such that a follow-up effort can be developed as necessary to target producers who did not participate in the initial program but who could have a significant impact on water quality in the watershed. This plan will be presented to NRCS (at the state and local levels) in an attempt to facilitate cooperation between the 319 program and the use of EQIP funds.

Task 9.3.3 Tracking of BMP Implementation

A GIS data layer of farm plans will be created and maintained by the Project Coordinator. BMPs as planned and implemented will be tracked for future watershed modeling and for reporting project performance. Project staff will make regular site visits to assess progress in implementing planned BMPs. Semiannual progress reviews will formally assess cooperator performance. Where implementation problems are identified, the Project Coordinator will follow through with plan revisions or cancellation of the cooperator's agreement and reallocation of the funds to demonstrate practices elsewhere within the project area. Details will be summarized in the project final report.

The final report will attempt, where possible, to report on BMPs implemented in the watershed through other means such as through the EQIP program, the State-funded, locally-led cost-share program, and solely through landowner funding. NRCS does not routinely release this information and therefore, it is unknown to what extent USDA program information can be reported. As possible, implementation data will be presented in a GIS format. At a minimum, financial information concerning EQIP and locally led cost-share funds will be presented. In addition, load reductions expected due to 319 implementation of practices will be estimated using a watershed-based model such as SWAT or StepL.

Task Objective: The purpose of this task is to implement those practices to reduce NPS loading to Honey Creek.

Task Schedule:

Subtask #	Milestone Description	Due Date
9.3.1.a	Appendix to WBP that includes a specific Pre-Implementation Plan (9.1.3) for this project which will provide greater detail on practices to be implemented as part of this project and expected results	January 2007
9.3.1.b	Presentation of specific Pre-Implementation Plan (9.1.3 and 9.3.1.a) to state and local level NRCS to facilitate cooperation between the 319 program and EQIP	January 2007
9.3.2	BMP Demonstration	January 2007 – July 2010
9.3.3	Tracking of BMP Implementation	January 2007 – July 2010

Deliverables:

Subtask #	Description	Due Date
9.3.1	Appendix to WBP that includes specific Pre-Implementation Plan for this project which will provide greater detail on practices to be implemented as part of this project and expected results	January 2007

Task Budget:

Total Demonstration	Producer Input %20	State Funds for BMP Demonstration	Federal Funds for BMP Demonstration
\$1,224,210 1,143,016.00	\$244,842 228,603.20	\$419,482 435,720.80	559,886 \$478,692.00

Task 9.4 Watershed Education Program⁹

This project is intended to affect long-term behavioral changes of watershed residents and users that will assure continued protection of water quality in the Honey Creek Watershed. Substantial effort in this project is devoted to determining and demonstrating practices essential for this goal. The education program must ensure widespread adoption of these practices over the entire watershed. The education program must also be established in a fashion such that it will continue past the life of the project. The education program will coordinate with ongoing programs in the watershed such as those funded under the FY 2004 project.

Task 9.4.A. The education program will be guided and implemented by the Project Coordinator. The Honey Creek education program will be developed around the following goals:

- (1) Working with Education Coordinator (FY 2004 Project) to involve landowners in the targeted areas in education programs specified through the FY 2004 project including Master Gardeners, Blue Thumb, Oklahoma Water Watch, Bioretention Cells, and whole-soil profiles.
- (2) Utilizing the demonstration farm established under the FY 2003 Spavinaw Creek Project to show producers the benefits of prescribed practices.
- (3) The project coordinator will write a monthly article for the tri-county newsletter published and distributed by the Delaware County Conservation District.
- (4) Focus a Blue Thumb program in the watershed.
- (5) Exhibits – develop a display for the project that can be used to educate the public on the 319 Program. Display should include basic information on the program, its cooperators, and contact people of ongoing programs in the watershed (including 2004 project contacts).
- (6) Publish at least one article a month in a newsletter or paper read by local citizens on project details and accomplishments.
- (7) Develop a recognition program for project cooperators.
- (8) Track how participation in the education program has changed people's behaviors. Project coordinator will follow ten percent of people intercepted through different aspects of this and related project activities and will contact them on an annual basis throughout the project period to determine whether they have made any changes that would affect NPS pollution.

⁹ Addresses component (e) of a Watershed Based Plan for the Honey Creek watershed. Additional information on component (e) can be found under task 9.2 of this workplan and in the Grand Lake Watershed Based Plan.

Task Objective: The purpose of this task is to develop an education program that will help the citizens of the Honey Creek Watershed reduce NPS pollution.

Task Schedule:

Subtask #	Milestone Description	Due Date
9.4.1	Conduct at least semiannual field trips for producers to demonstration farm in Spavinaw Watershed (minimum of four trips & 16 participants during first two years of project.	March 2007, 2008 September 2007, 2008
9.4.2	Distribute monthly tri-county newsletter to watershed residents (may coordinate with FY 2004 Project activities)	Beginning November 2006 – September 2010
9.4.3	Hold Blue Thumb Training in watershed	March 2007
9.4.4	Develop a display on program that is showcased at a minimum of 4 fairs, home shows, or similar events each year during the project.	March 2007
9.4.5	Begin publishing at least one article a month on program in paper or newsletter read by local citizens	December 2006
9.4.6	Develop a recognition program for local cooperators- articles, certificates, signs, etc. Program must have WAG approval	June 2007
9.4.7	Tracking behavioral change	Throughout project

*Position not included or funded under FY2005/5006 319(h) Projects 6-8.

Deliverables:

Subtask #	Description	Due Date
9.4.1	Three copies of all education materials produced during the project and summary of behavioral change study	Included with final report

Measures of Success

Overall success of this task will be assessed largely by tracking behavioral change. At least thirty percent of people reached through the project will enact some sort of behavioral change to protect water quality and reduce NPS pollution.

Task Budget:

Supplies
\$20,600.00

Task 9.5. Measurement of Success¹⁰

Substantial monitoring has been completed in the Honey Creek and Grand Lake Watershed that has identified numerous water quality problems as shown in the introductory paragraphs of this work plan. In addition, under Task 9.1, critical areas will be identified in the watershed that are suspected to contribute most significantly to NPS loading in the watershed. This information could provide a baseline for comparison to evaluate changes in water quality and potential sources over the project period.

Subtask 9.5.1: Follow-up GIS evaluation of Land Use/Land Cover Changes.

The ultimate measure of success of the project will be restoration of beneficial use support in Honey Creek improvement in the Honey Creek cove of Grand Lake and protection of its natural resources. A monitoring program is proposed below to evaluate this success. However, due to the extent of the problem in Honey Creek and the point source discharger in Missouri, it is unlikely that significant improvements in water quality will be measurable at the end of the project period. Therefore, water quality monitoring to evaluate success of the project will be supplemented by replicating Task 9.1, GIS Targeting at the end of the project, to measure changes in landuse and cover quality. It is anticipated that at least 30% of the landowners in the Oklahoma portion of the watershed will have participated in the project and that the amount of bare soil or chronically overgrazed pasture will decrease by 40%.

Subtask 9.5.2. Water Quality Monitoring

Due to the number of changes ongoing in the watershed relative to past projects, lawsuits, and other factors, it is important to continue to monitor water quality in the system.

OCC will install autosamplers on Honey Creek, one at the state line, one near the mouth of the creek near the lake, and one on Saline Creek as a reference site. These autosamplers will be used to collect continuous phosphorus concentrations. In addition, OCC will conduct routine physico-chemical, biological, and habitat monitoring at these sites. Water Quality Monitoring will begin on a monthly basis once the QAPP is approved, and continue throughout the length of the project.

To focus on the parameters of concern, and to reduce monitoring expenses, water quality samples will be analyzed only for total phosphorus, nitrate-nitrogen, nitrite-nitrogen, ammonium nitrogen, total coliform, *E. coli*, and *Enterococcus* bacteria. Field parameters to be collected include dissolved oxygen, pH, temperature, turbidity,

¹⁰ This section contains components (h) and (i) of a WBP specific for the Honey Creek subwatershed. Additional information can be found in the Grand Lake Watershed Based Plan.

conductivity and instantaneous discharge, and alkalinity. Periphytometers may be deployed to measure primary productivity. The QAPP will be submitted by June 2006.

The Oklahoma Water Resources Board, Oklahoma Department of Environmental Quality, and the USGS maintain water quality monitoring stations in the Honey Creek Watershed. Data from these stations will also be evaluated according to Oklahoma's water quality standards and Use Support Assessment Protocols to determine whether or not measurable water quality changes have occurred as a result of project efforts.

Due to the concern over potential impacts from septic systems to the watershed, OCC will monitor to estimate the relative impact to areas where septic systems are concentrated. OCC will monitor in two coves of the lake for pollutants indicative of human waste such as but not limited to, caffeine, bacteria, and nitrogen compounds. One cove will have a large number of septic systems, the other, one with fewer septic systems spread farther from the lake, will serve as a reference system. Near shore presence of these compounds in the absence of significant mid-lake concentrations of the same compounds will provide evidence of loading from septic systems. Samples will be collected during different times of the year (summer recreation season vs. winter) and during baseflow vs. runoff conditions in the watershed to determine whether these conditions significantly impact bacteria in the lake. Bacteria monitoring completed by Oklahoma Water Watch and Blue Thumb volunteers under FY 2004 Project 5 may be evaluated to develop sampling strategies relative to number of samples collected, seasonality of sampling efforts, and sampling sites.

Subtask 9.5.3.

In addition, OCC will document success with before and after photos of implementation sites. Initial photos will be taken at the time of farm plan preparation. Secondary Photos will be taken immediately following BMP installation. Final photos will be taken near the end of the project. This documentation will be summarized in the final report.

Additional measures of success include:

- Full implementation of BMPs as planned in task 9.3.
- A substantial part of the project funding is going toward personnel to work in the watershed to establish and or update conservation plans. The goal for this effort is for 80% of the targeted farms in the Honey Creek Watershed to have current conservation plans. We will expect that 60% of those will actively implement the practices recommended in the plans.
- To reach a 20 % reduction in potential load, based on water quality modeling such as SWAT or StepL.

The results of these efforts, along with the project, will be detailed in the project final report.

Task Schedule:

Task #	Milestone Description	Due Date
Task 9.5.1	Follow-up GIS evaluation	March – August 2010

Task 9.5.2	Secondary data QAPP and Septic tank monitoring QAPP	December 2006
Task 9.5.3	Photodocumentation of BMPs	Throughout the project

Deliverables¹¹:

Subtask #	Description	Due Date
9.5.1	Follow-up GIS evaluation	September 2010 (in final report)
9.5.2	Water quality monitoring QAPP	July 2006
9.5.3	Photodocumentation and Secondary data QAPP and Septic tank monitoring QAPP	December 2006
9.5.4	Final Report	September 2010

Task Budget:

Subtask #	Contractor*	Subcontractor	Fringe	Supplies	Travel	Total
9.5.1- Follow-up GIS	\$16,742	\$20,000	\$2,258	\$500	\$500	\$40,000*
9.5.2	\$52,000			\$29,194		\$81,194
Septic Impacts Monitoring	\$98,000 ¹²			\$2,000		

*total payable to contractor

Total Project Outputs:

Task #	Description	Person Responsible	Due Date
9.1.1	First Stage Targeting Results	Contractor	July 2006
9.1.3	Final Targeting Mechanism	Project Coordinator	December 2006
9.2.3	Meeting Minutes and Agendas	Project Coordinator	With final report
9.3.1	Appendix to WBP that includes specific Implementation Plan for this project which will provide greater detail on practices to be implemented as part of this project and expected results	Project Coordinator	January 2007
9.4.1	Three copies of all education	Project Coordinator	Included with final

¹¹ To be completed by OCC tech writers funded under FY 2006 – 2010 Project 2.

¹² Laboratory analysis to be completed by contract laboratory.

	materials produced during the project		report
9.5.1	Follow-up GIS evaluation	OCC Tech Writers	September 2010 (in final report)
9.5.2	Water quality monitoring QAPP	OCC Tech Writers	July 2006
9.5.3	Photodocumentation and Secondary data QAPP and Septic tank monitoring QAPP	OCC Tech Writers	December 2006
9.5.4	Final Report	OCC Tech Writers	September 2010

Project Management:

This project will be managed by the Oklahoma Conservation Commission in cooperation with the Office of the Secretary of the Environment. The Oklahoma Conservation Commission will provide oversight for all project activities. NRCS will provide technical support and administration of USDA programs.

Project Duration:

Four years.

Project Budget¹³:

Project 9. Honey Creek Watershed Project	
State	\$664,324
Federal	\$996,486
Total	\$1,660,810
Object Class Categories	
a. Personnel	\$152,000
b. Fringe Benefits	\$52,000
c. Travel	\$6,000
d. Equipment	\$0
e. Supplies	\$73,794
f. Contractual	\$234,000
g. Construction	0
h. Other	\$1,143,016
i. Total Direct Charges (sum of 6a-6h)	\$1,660,810.00
j. Indirect Charges	

¹³ This section more specifically identifies additional information relative to component (d) of a Watershed Based Plan. Additional information can be found in under Task 9.2 of this workplan and in the Grand Lake Watershed Based Plan

k. TOTALS (sum of i and j)	\$1,660,810.00