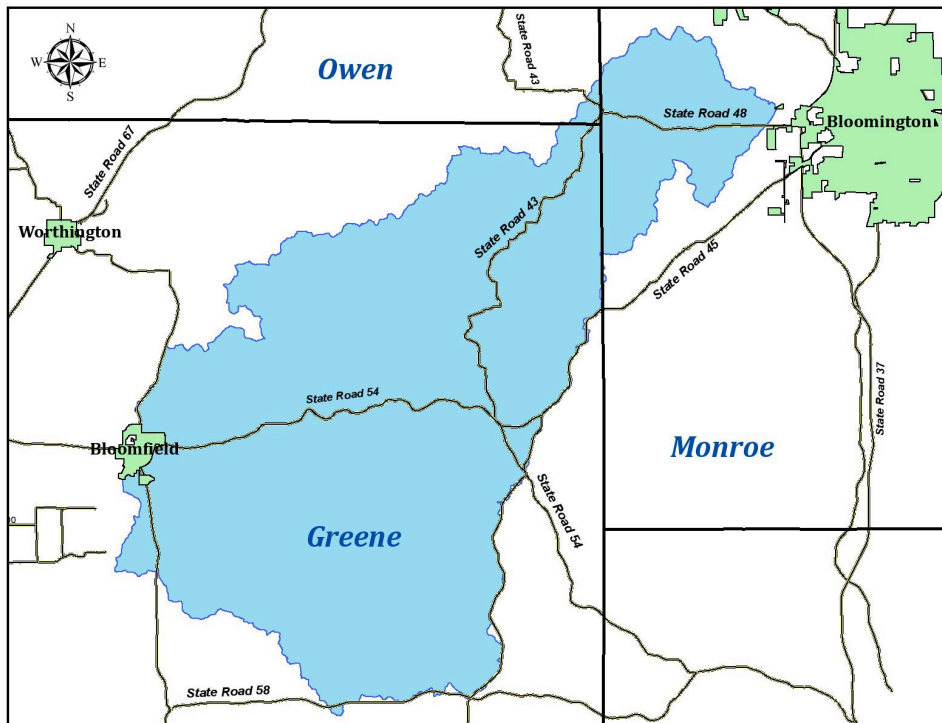


2016-2019

# Plummer Creek Watershed *319 Implementation I Project* Final Report



*ARN:* 305 6-226

*Project Sponsor:*

Greene Co. SWCD

*Report Period:* May 19<sup>th</sup>, 2016-  
May 18<sup>th</sup>, 2019

*Report Completed by:*

Laura Demarest, Watershed  
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## **INTRODUCTION and OVERVIEW**

The PCWP 319 Implementation project officially began on May 19<sup>th</sup>, 2016 and ended on May 18<sup>th</sup>, 2019. It ran concurrently with the PCWP Implementation II grant (#30680) for its final 3 months, allowing for the successful carryover of producers, partners, and practices. The purpose of the PCWP 319 Implementation project was to implement a variety of conservation BMPs throughout the area, resulting in improved regional water quality and management changes at the individual farm level, in order to work towards achieving the goals outlined in the WMP.

The PCWP 319 Implementation grant (A305-6-226) was primarily managed by Watershed Coordinator, Laura Demarest, with the financial oversight of the Greene SWCD Board and SWCD Coordinator, Casey Kennett.

## **PROJECT GOALS AND OBJECTIVES**

The original application for funding included several generalized goals, which were adapted into ‘Tasks’ for the Grant Agreement and can be found summarized below. The Grant Application also included a number of ‘Outcomes and Measures of Success’, which will also be discussed further.

### ***Goals from the PCWP Watershed Management Plan (WMP pg. 131):***

- Increase resources that will assist with increasing knowledge and awareness while helping implement best management practices designed to alleviate water quality concerns within the watershed.
- Decrease current nitrogen concentrations to meet target concentrations within 20 years.
- Decrease current phosphorous loads to meet target loads within 20 years.
- Decrease current total suspended solids load to meet the limit set by the IDEM within 20 years.
- Decrease current turbidity concentrations to meet target concentration limits within 20 years.
- Decrease current E. coli load to Indiana Water Quality Standard for recreational contact within 25 years.
- Increase habitat scores to meet CQHEI and QHEI standards within 20 years.
- All sites monitored show a healthy macroinvertebrate population within 25 years.

The WMP also lists various load reduction goals for specific critical area acreage, though the timeframe is for 20 years and therefore cannot be evaluated at this stage or with the amount of data collected to date. In fact, since all of the goals outlined in the WMP fall within the longer-term, 20 (or more) year range, it is difficult to fairly evaluate overall success towards achieving these WMP goals at this time as more information is needed.

Continuing to work towards the fulfillment of the goals of the PCWP WMP through implementation was to be accomplished through a variety of efforts that were organized according to “Tasks”. Within the scope of each Task were a number of objectives to be completed in order to satisfy the overall goals of the PCWP 319 Implementation project. The completion of these tasks will be presented at length in the next section of this report. The requirements of each Task are summarized as follows:

### ***Task A: Develop and Promote a Cost-Share Program to fulfill goals of the PCWP WMP***

- Meet quarterly with the Advisory Committee to review progress and concerns of the SWCD and landowners.
- Meet with landowners to determine their needs, prioritize funding for the most effective BMPs in critical areas
- Work in conjunction with NRCS District Conservationists to promote conservation cropping systems

### ***Task B: Cost-Share Implementation***

- Implement the approved cost-share program described in Task A.
- Ensure that all BMPs conform to NRCS specifications or other applicable, approved specifications.
- Implement BMPs only in critical areas as described in the PCWP WMP.
- Follow cost-share payment and reporting protocol according to IDEM 319 program requirements.
- Tabulate pollutant load reductions for every BMP funded by 319 or utilized for match.
- Create and maintain a geo-referenced database for all BMPs implemented through the 319 project.

### ***Task C: Water Quality Monitoring and Analysis***

- Develop a Quality Assurance Project Plan (QAPP) for monitoring activities: submit to the State for approval.
- Conduct volunteer ‘trend’ monitoring on a quarterly basis for three years on the same sites used previously
- Parameters include: phosphorus, nitrates, turbidity, H, temperature, TSS, BOD, conductivity, DO, E.coli, flow
- Complete QHEI assessment and macroinvertebrate sampling on all sites at least once per year.

### ***Task D: Education and Outreach***

- Conduct an education and outreach program that includes the following efforts:
  - Hold at least two (2) field days, tours, or workshops to educate watershed landowners about nonpoint source pollution and/or the importance of incorporating best management practices into their management programs per year for a total of six (6). Topics include cover crops, stream bank stabilization, livestock manure management, and septic systems. Pre and post surveys to assess knowledge gained will be administered and analyzed for each event.
  - Promote and distribute four (4) total newsletters to watershed residents focused on promoting best management practices.
  - Update the Plummer Creek webpage quarterly and share update with Monroe and Owen County SWCDs.
  - Advertise cost-share program seven (7) times during the grant utilizing available media.
  - Develop at least six (6) flyers and six (6) brochures to supply landowners, producers, and community members with information about cost-share programs, best management practices, and septic system maintenance.
  - Conduct two (2) stream or roadway cleanups
  - Participate in ten (10) community events to provide information on water quality and promote cost-share programs
  - Conduct one (1) stakeholder meeting each year to promote the watershed project

### ***Task E: Reporting***

- Prepare and submit a progress report to the State with each invoice package, at least quarterly.
- Submit two electronic copies of a final report to the State via USB.

The 319 grant application for Plummer Creek Implementation also featured a number of “Outcomes and Measures of Success”, which are summarized below and will be discussed in an upcoming section of this report.

### ***“Outcomes and Measures of Success”***

- Develop and Promote Cost-Share Program
  - 1) Cost-Share Program created/marketed/completed and approved by IDEM
  - 2) 5% increase in stakeholders attending meetings/join PCWA vs. numbers during planning phase
  - 3) Implement BMPs on at least 1% of land within defined critical areas of PCW
  - 4) Usage of 100% of cost-share funds
- Implement BMPs
  - 1) Number of landowners/users involved in cost-share programs
  - 2) Number of acres enrolled in cost-share programs
  - 3) Number of acres affected due to load reductions will be 1,000 acres
- Reduce loads of nitrogen by 10%, total phosphorus by 10%, TSS by 3%, E.coli by 8%, and turbidity by 15%
  - 1) Implement BMPs on at least
    - a) 80% of crop land
    - b) 50% of pasture land
    - c) 5% of forest
    - d) 30% of feedlots

2) These results at the end of the project period will show significant progress toward the overall goal of reaching water quality standards.

- Increased awareness of water quality concerns and conservation practices
  - 1) 30% increase of knowledge of members attending shown through pre/post survey
  - 2) Develop/distribute 6 newsletters/6 flyers/6 brochures
  - 3) Stakeholder meetings with 10% increase in annual attendance
  - 4) 7 press releases for cost-share program
  - 5) 2 stream/roadway cleanup using volunteers
- Improvement in habitat scores by 5% (CQHEI) and an increase in macroinvertebrate scores by 5%
  - 1) Improvement/increase verified through Riverwatch Monitoring activities

## **EVALUATION OF GOAL ACHIEVEMENT**

Overall, the PCWP 319 Implementation project proved to be a success, providing an abundance of BMP opportunities for producers in the watershed. This success can largely be validated by assessing the completion of the items listed in each of the previously outlined Tasks (discussed in detail below). Many favorable trends in producer interest and participation in conservation efforts were noted throughout the duration of the project. Originally there was a bit of concern about how well the implementation efforts would be adopted by local landowners as the identified Tier I critical areas focus on livestock and cropland and much of the watershed area is forested. However, after some positive interactions through an early project with a prominent local farmer in the American Bottoms area, the word spread quickly and within one year, the cost-share funds were completely obligated and a wait list started! The power of local word-of-mouth proved to be a major key to success and netted much more interest than any sort of advertising.

The PCWP Implementation project utilized every cent of the 319 grant funding, exceeded the match goal, and delivered a variety of conservation projects to producers in critical areas. Most of the applicants were completely new to conservation programs. Cover crops and Nutrient Management in the form of precision agriculture technology upgrades gained the most traction during the course of implementation, netting the highest load reductions and interested inquiries. Also popular were livestock-related practices such as HUAPs, spring developments, and frost-free watering systems. Moreover, many helpful lessons were gleaned during the course of this grant project, which will enable future conservation efforts to benefit considerably.

When considering the specific goals stated in the PCWP Watershed Management Plan, it is premature to gauge overall completion, as the PCWP initiative continues in the form of the PCWP 319 Implementation II project, for which an additional 319 grant was awarded in 2017. This grant will serve as a Phase II for the PCWP implementation initiative, and began in March 2019. As previously mentioned, the goals of the WMP are outlined to be completed within 20-25 years and will not be discussed in this report, though continued evaluation will occur during Implementation Phase II with the incorporation of new data in order to gauge progress towards their fulfillment.

## **COMPLETION OF TASKS**

One straightforward way to quantify the success of the PCWP Implementation grant project is to review the completion of the objectives outlined in each Task as well as the “Outcomes and Measures of Success” from the 319 application for this project. More complex topics will be further discussed and analyzed as necessary. Supporting documentation can be found in the PCWP Final Report USB Appendices.

### ***Task A: Develop and Promote a Cost-Share Program to fulfill goals of the PCWP WMP***

- Meet quarterly with the Advisory Committee to review progress and concerns of the SWCD and landowners

The PCWP Advisory Committee continued with many of the same stakeholders who regularly participated through the first PCWP Planning grant. The PCWP Advisory Committee was required to meet at least quarterly (a minimum of 12 times) during the time of the PCWP 319 Implementation grant. Meetings were sometimes more or less frequent than quarterly, depending on the group's needs. Supporting documentation for all meetings can be found in **Appendix A** on the PCWP A305-6-226 Final Report USB.

Advisory Committee meeting dates:

*5/18/16, 8/2/16, 10/11/16, 2/6/17, 6/6/17, 10/23/17, 12/12/17, 4/24/18, 11/27/18, 3/19/19, 4/15/19, 4/30/19*

**Lessons Learned:** Overlapping grants have the potential to make meeting Task requirements difficult. For instance, with concurrent PCWP grants, the Advisory Committee meetings had to be doubled during the overlap period so that meetings could be 'counted' separately for each grant. These meetings sometimes felt compulsory, especially during implementation, where attendance dropped off considerably after the Cost-Share Guidelines were created. The lower attendance could be due to the fact there is less 'heavy' decision-making involved during implementation when compared to the planning phase. In the future, it is worth considering that fewer meetings be required during the implementation phase as there may not be as strong of a need for frequent feedback from the Advisory Committee through the entire project (as opposed to during Planning). A group can always meet more often than the Task requirement states, if necessary.

- Meet with landowners to determine their needs, prioritize funding for the most effective BMPs in critical areas
- Work in conjunction with NRCS District Conservationists to promote conservation cropping systems

### ***Task B: Cost-Share for BMP Implementation***

- Implement the approved cost-share program described in Task A

The PCWP Implementation Cost-Share Program was approved by IDEM on 10/11/16. Documentation regarding the Cost-Share Program can be found in **Appendix A**.

Within one year of the PCWP 319 Implementation grant, all of the cost-share funding had been completely obligated and more producers were still asking to apply. Additional implementation funds were requested in the form of another 319 Implementation grant, which was selected for funding and is started in March 2019. All BMPs were installed according to NRCS (or other approved) specifications and in accordance with IDEM 319 program guidelines. See below for a summary of BMP Implementation projects and **Appendix B** on the PCWP Final Report USB for a complete list of BMP documentation.

In summary, the PCWP 319 Implementation grant was very successful, resulting in the installation of an impressive number BMPs on critical area acreage. Many of these producers were first-time participants and young farmers who showed keen interest especially when it came to cover crops, precision agriculture, and spring developments. This is a promising observation for future conservation sustainability in the Plummer Creek watershed region.

#### **Total BMPs implemented in Plummer Creek critical areas (2016-2019):**

- *HUAP = 26,011 ft<sup>2</sup>*
- *Roof Runoff Facility = 525'*
- *Nutrient Management/Precision Ag Tools = 2,074.78 acres of load reductions (1,007.72 single acres)*

- *Spring Development = 4*
- *Water Tanks installed = 9*
- *Cover Crop/Cover Crop Seeders = 421 acres*
- *Cover Crops (planted) = 142.21 acres*
- *Prescribed Grazing = 17.31 acres (Fence = 472' installed)*
- *WASCOBs = 5*

The total pollutant load reduction estimates of the BMPs installed as a direct result of the PCWP 319 Implementation project are summarized as follows:

- *Sediment: 2,011.1 tons/year*
- *Nitrogen: 27,256.57 lbs/year*
- *Phosphorus: 4,590.69 lbs/year*

**Lessons Learned #1:** Garnering enough interest for cost-share funding was initially a concern due to the fact that critical area acreage (livestock and cropland) was minimal compared to other watershed project areas and largely spread out and interspersed with forest. Additionally, eastern Greene County is a very rural area that is perceived to have a ‘rogue’ mindset when it comes to government programs and offerings. Fortunately, the first customer was a prominent farmer in the American Bottoms area and once trust had been established, word-of-mouth quickly spread throughout farmers in the county. This method of promotion was far more successful for this project than any form of media advertising.

**Lessons Learned #2:** Livestock producers have different needs and cash-flow restrictions compared to grain farmers, so many of the projects required more oversight and sometimes followed a step-by-step schedule of getting a few items constructed as funding allowed. Incidentally, there were some delays, most of which were weather-related or, in a few cases, the result of a producer signing up for a too-ambitious project load. In the future, it may be prudent to assign an earlier ‘deadline’ for engineering projects to be completed or to consider limiting the number of projects for a first-time applicant. Fortunately for the PCWP Implementation project, there were a number of projects on the WAIT LIST, many of which have relatively quick turn-over, such as Precision Ag. Technology and No-Till Planter upgrades.

- Ensure that all BMPs conform to NRCS specifications or other applicable, approved specifications.
- Implement BMPs only in critical areas as described in the PCWP WMP.
- Follow cost-share payment and reporting protocol according to IDEM 319 program requirements.
- Tabulate pollutant load reductions for every BMP funded by 319 or utilized for match.
- Create and maintain a geo-referenced database for all BMPs implemented through the 319 project.

Pollutant load reduction totals corresponding to each individual project are reported in the Quarterly Progress Reports submitted to IDEM with each Invoice Package. See **Appendices E and F** for further details. Shapefiles for the implemented practices can be found in **Appendix B**.

### ***Task C: Water Quality Monitoring and Analysis***

- Develop a Quality Assurance Project Plan (QAPP) for the monitoring activities and submit it to the State for approval.

The QAPP for trend monitoring during PCWP Implementation was approved 7/27/17.

For the PCWP 319 Implementation grant, it was stipulated that 5 sites would undergo ‘trend monitoring’ quarterly (a total of 12 sampling events) during the course of the project.

**Lessons Learned:** The QAPP was not submitted for approval until over 1 year into the PCWP Implementation grant, which necessitated more frequent monitoring in the final two years to meet the requirement of 12 total monitoring sessions. Implementation of BMPs through the development and promotion of the Cost-Share Program was the #1 priority for this grant, which meant most of the attention and effort was diverted towards handling customer requests for projects, conducting on-site planning, submitting engineering requests, compiling planning documents, verifying project completion, and processing payments. The QAPP and other monitoring-related tasks were often (unfortunately) relegated to the ‘back burner’ in order to ensure that implementation efforts and customers were handled first and foremost.

Additionally, when applying for a 319 Implementation grant for the PCWP watershed, it was specifically stipulated that monitoring would not be funded during implementation. Therefore, a modest schedule for trend monitoring was outlined in the application, chiefly involving Hoosier Riverwatch methods and the usage of an in-house YSI probe that had been in a closet for approximately 2 years with no maintenance. In the previous PCWP Planning and Implementation grant, many of the most important pollutant parameters (Nitrogen, Phosphorus, E.coli, etc.) were funded for lab testing, which provided precise data used during the development of the WMP. Searching for methods that offered the same (or comparable) precision and detection limits WITHOUT funding proved to be quite difficult and frustrating. Hoosier Riverwatch methods offer some tools for collecting some of this data to a comparable level of precision (E.coli), but many of the methods (Turbidity tube, Orthophosphate ampoules, Nitrate/Nitrite test strips) were not comparable with the detection limits/tools/methods used to collect this data during the Planning phase, making trend monitoring of questionable value for this implementation project, especially when the WMP Water Quality Targets for Total Phosphorus and Nitrates/Nitrites were at the lower end of the detection limits offered by H. Riverwatch tools.

In an effort to acquire more comparable data, extensive maintenance of the YSI monitoring probe occurred only to determine that sensitive probes ( $\text{NH}_4$  and  $\text{NO}_2/\text{NO}_3$ ) already purchased during the Planning phase have a short shelf life (~6 months, according to manufacturer) . The probe never properly calibrated and then misbehaved in the field, yielding unusable results. Replacement probe attachments and additional calibration solutions were cost-prohibitively expensive. Much time and energy was spent ‘tinkering’ with this probe to little success. It is recommended that it be considered for retirement. Better results were achieved with E.coli samples, which were plated and read at a ‘home’ lab set-up. No adequate tool/method for TSS/TDS was found that did not involve expensive costs, so Turbidity Tube methods were utilized for this project.

It should also be noted that the ‘committed’ \$5,000 for monitoring expenses promised by Baxter Pharmaceutical in a Letter of Support during the application phase was not furnished. When the 319 Implementation grant commenced, the individual who had originally offered the funding was gone and no record of this offer seemed to exist when others in the company were approached.

Overall, strong efforts and attempts were made to uphold the required monitoring standards, but in the future, a group should give heavy consideration to the importance of continued monitoring during implementation if there will not be adequate funding for the collection of data that is useful to the project in terms of WMP load reduction comparisons and accurate evaluation of progress towards short and long-term goals.



- Conduct volunteer ‘trend’ monitoring on a quarterly basis for three years on the same sites used previously

All data collected was entered into the specified IDEM Spreadsheet, which can be found in **Appendix C** on the PCWP Final Report USB.

Samples were collected for the following months:

- November 1, 2017 (QHEI, Macroinvertebrates)
- January 30<sup>th</sup>, 2018
- March 27<sup>th</sup>, 2018
- May 29<sup>th</sup>, 2018
- August 1<sup>st</sup>, 2018
- September 17<sup>th</sup>, 2018
- November 5<sup>th</sup>, 2018 (QHEI, Macroinvertebrates)
- December 18<sup>th</sup>, 2018
- January 28<sup>th</sup>, 2019
- February 11<sup>th</sup>, 2019
- March 25<sup>th</sup>, 2019
- April 22<sup>nd</sup>, 2019 (QHEI, Macroinvertebrates – approval received to sample out of season)

At times, some of these sites were not able to be sampled due to weather-related hazards (flooded or icy roads) or dangerous access due to heavy traffic, hunting, other people using the site, or swift water currents. Some sites were unsafe to sample or conduct macroinvertebrate collection during times of high flow. A note to indicate the reason that sampling was not performed was included in the field books, housed at the Greene SWCD office. An entry of ‘NS’ (Not Sampled) is reflected on the IDEM spreadsheet. An overview of the sampling sites can be found in the QAPP in **Appendix C** on the PCWP Final Report USB. All compiled data from the PCWP water monitoring program can be found in **Appendix C**, as well. Further discussion regarding the collected data can be found on page 15 of this report.

- Parameters include: phosphorus, nitrates, turbidity, pH, temperature, TSS, BOD, conductivity, DO, E.coli, flow

As previously discussed, attempts were made to collect samples following all of the listed parameters, though the YSI probe proved to be difficult and expensive to maintain, which mostly affected the collection of data for N, conductivity, pH, and Turbidity (using the YSI probe attachment) which proved to be the most sensitive probe attachments. Phosphorus was collected in the form of orthophosphate. Turbidity shifted towards use of a Turbidity Tube. Other parameters were collected as stipulated in the QAPP, which followed the Grant Agreement requirements.

- Complete QHEI assessment and macroinvertebrate sampling on all sites at least once per year.

Macroinvertebrate sampling and QHEI assessments were conducted three times during the course of the project, though severe weather and a delayed QAPP thwarted efforts during ideal time windows. Permission was obtained from the IDEM Project Manager to conduct sampling outside of normal collection windows. Assessments were attempted on all sites and recorded for those that were accessible and without hazards.

## Task D: Education and Outreach

Conduct an education and outreach program that includes the following efforts:

- Hold at least two (2) field days, tours, or workshops to educate watershed landowners about nonpoint source pollution and/or the importance of incorporating best management practices into their management programs per year for a total of six (6). Topics include cover crops, stream bank stabilization, livestock manure management, and septic systems. Pre and post surveys to assess knowledge gained will be administered and analyzed for each event.

The PCWP watershed project generated many opportunities to partner with other agencies for local and regional events that promoted conservation practices. Attendees were tracked at events, as represented below. Further discussion regarding each individual event can be found within the Quarterly Progress Reports, which have been compiled in **Appendix E** on the PCWP Final Report USB.

- 9/6/17 Presentation for 319 at Greene County Council public meeting
- 11/15/17 Under the Watershed Field Day
- 1/26/18 INField Advantage Winter meeting
- 8/9/18 Women's Ag Forum
- 1/31/19 INField Advantage Winter meeting
- 3/18/19 Greene Co. Cattleman's Annual mtg

**Lessons Learned:** There were more than a few occasions where partnership planning fell through for field days or the subject matter changed to focus solely on topics that did not serve the 319 grant project goals (i.e. invasive plant removal, youth education). In the future, the Plummer Creek Watershed Coordinator and Advisory Committee should prepare to take more agency over the planning and execution of field days in this region as partner commitment can be sometimes unreliable. Several organizations who pledged avid support did not always follow through.

- Promote and distribute four (4) total newsletters to watershed residents focused on promoting best

The PCWP 319 Implementation project was to be promoted through the distribution of a newsletter. The newsletters were circulated to the PCWP email list, mailed out with the Greene SWCD newsletter, and placed on the [www.watershed-alliance.org](http://www.watershed-alliance.org) website. Greene SWCD Coordinator/Educator, Casey Kennett, was responsible for compiling these newsletters for distribution. Copies of all PCWP Newsletters can be found in **Appendix D** on the PCWP Final Report USB and are still housed on the website.

Newsletters were created for the following months:

- Greene SWCD Summer 2016
- Greene SWCD Winter 2016
- Greene SWCD Summer 2017
- Spring 2018 (Greene SWCD FB page – no newsletter was widely distributed by the SWCD this year)

- Develop at least six (6) flyers and six (6) brochures to supply landowners, producers, and community members with information about cost-share programs, best management practices, and septic system maintenance.

All flyers and brochures can be found in **Appendix D** on the Plummer Creek Final Report USB.

- Conduct two (2) stream or roadway cleanups

Stream clean-ups were conducted two times with a 5<sup>th</sup> grade group taught by Mr. Erin Raper. Mr. Raper is also a 319 customer who owns a small cattle farm and implemented several BMPs. The class at Bloomfield Elementary School was able to walk to a nearby creek to pick up trash for approximately 1 hour at the end of the school day. The first year it was a small after-school group of about 15. The following year all three 5<sup>th</sup> grade classes participated (approximately 60 students + 5 teachers/staff) and collected hundreds of pounds of trash and several tires. Supplies (gloves, trashbags, 5 gallon buckets) were provided by some 319 grant funding. The Greene County Recycling Center graciously accepted several tires at no cost.

Dates for Stream Clean-ups: 4/10/17 and 4/18/18

- Update the Plummer Creek webpage quarterly and share update with Monroe and Owen County SWCDs.

The Greene SWCD Facebook page (managed primarily by Casey Kennett, Greene SWCD Coordinator) was also used to provide updates about events, workshops, and photo sharing. The webpage [watershed-alliance.org](http://watershed-alliance.org) was managed by Watershed Coordinator, Laura Demarest. Regular updates regarding Advisory Committee meetings, cost-share opportunities, and other related information were shared mainly on these two venues.

- Advertise cost-share program seven (7) times during the grant utilizing available media.

News regarding the PCWP watershed project was often featured in the Greene newspaper. Since the watershed is situated primarily in Greene County it was not often necessary to interface with the media of neighboring counties as frequently, though partner SWCDs and other organizations informally circulated news of events/workshops via their own email lists/social media.

**Articles and Advertisements:**

- 7/19/16 (GCDW article), 7/27, 7/29, 7/30, 8/2, 8/1 (Ads in GCDW + The Shopper), 8/5/16 (GCDW article), 9/2016 (3 weekly ads in The Shopper)

- Participate in ten (10) community events to provide information on water quality and promote cost-share programs

Community events are listed below. More detailed descriptions of each event can be found in the QPRs in **Appendix E**.

- 2016 Greene Co. 4-H Fair booth
- 7/20/16 Presentation to students/adults at Tulip Trestle

- 10/2016 NRCS Locally-Led meeting
- 2/23/17 Owen Co. SWCD Annual meeting
- 3/18/17 Greene Ag. Day breakfast
- 2017 Greene Co. 4-H Fair
- 9/6/17 – Greene Co. Budget Hearing proposal/info to County Council members
- 9/23/17 Owen County Water Day
- 4/27-28/18 Greene Co. Flower and Patio Show
- 9/22/18 – Owen County Water Day

- Conduct one (1) stakeholder meeting each year to promote the watershed project management practices.

Stakeholder meetings were conducted each year in the form of the Greene County SWCD Annual Meeting. An extensive update on the 319 project was provided, an Annual 319 Report, and a ‘Friend of the Watershed’ award announced. Supporting documentation can be found in **Appendix D**. Dates for each meeting are listed below:

- 2/22/17 – Greene County SWCD Annual meeting
- 3/7/18 – Greene County SWCD Annual meeting
- 2/26/19 – Greene County SWCD Annual meeting

### ***Task E: Reporting***

- Prepare and submit a progress report to the State with each invoice package at least quarterly.

A total of 11 Quarterly Progress Reports were submitted during the course of the PCWP 319 Implementation project, meeting the Task E requirement. Copies of all Progress Reports can be found in **Appendix E** on the PCWP Final Report USB. Dates for report periods are listed below:

- June 20<sup>th</sup>, 2016-August 29<sup>th</sup>, 2016
- August 30<sup>th</sup>, 2016-December 21<sup>st</sup>, 2016
- December 22<sup>nd</sup>, 2016-March 16<sup>th</sup>, 2017
- March 17<sup>th</sup>, 2017-July 24<sup>th</sup>, 2017
- July 25<sup>th</sup>, 2017-August 30<sup>th</sup>, 2017
- August 31<sup>st</sup>, 2017 – February 6<sup>th</sup>, 2018
- February 7<sup>th</sup>, 2018 – July 25<sup>th</sup>, 2018
- July 26<sup>th</sup>, 2018-September 31<sup>st</sup>, 2018
- October 1<sup>st</sup>, 2018-December 13<sup>th</sup>, 2018
- December 14<sup>th</sup>, 2018-March 31<sup>st</sup>, 2019

\*Note: This Final Report will capture progress/events that occurred between April 1<sup>st</sup>, 2019 and the close of the grant period 5/18/19.

- Submit two electronic copies of a final report to the State.

The PCWP 319 Implementation project Final Report and all supporting documentation was submitted to the State on two USBs and provided to the Watershed Specialist on a dedicated USB. All hard copy information will be retained at the Greene SWCD Office.

## “Outcomes and Measures of Success” – Discussion of Completion

- ***Develop and Promote Cost-Share Program***

- Cost-Share Program created/marketed/completed and approved by IDEM
- 5% increase in stakeholders attending meetings/join PCWA vs. numbers during planning phase

Unfortunately attendance at Advisory Committee meetings tapered off considerably during the Implementation phase. There are several potential reasons for this including the lack of ‘weighty’ decisions to be considered after the Cost-Share Guidelines were completed. Another reason could be the fact that the funding was completely obligated in the first year and those who participated in meetings with the intention of applying for implementation funding had already received what they sought or were ineligible for what the program was offering. Additionally, a prominent Advisory Committee member passed away during this grant period, which deflated meeting moods and attendance (he encouraged participation from farmers in his area) to some degree.

- Implement BMPs on at least 1% of land within defined critical areas of PCW

A total of 32,265 acres are defined as ‘critical’ according to the Plummer Creek WMP. During this Implementation period over 1,588.24 acres were improved through 319 funding, which exceeds the 322.65 (1%) goal.

- Usage of 100% of cost-share funds

- ***Implement BMPs***

- Number of landowners/users involved in cost-share programs

14 unique producers participated in the BMP implementation program and over half had never participated in a government conservation program of any type before 319.

- Number of acres enrolled in cost-share programs

Over 1,588.24 acres were impacted directly through the use of BMPs and 319 funding.

- Number of acres affected due to load reductions will be 1,000 acres

As previously stated, over 1,588.24 acres were improved through 319 funding, resulting in the following calculated load reductions during the course of this grant:

- *Sediment: 2,011.1 tons/year*
- *Nitrogen: 27,256.57 lbs/year*
- *Phosphorus: 4,590.69 lbs/year*

- ***Reduce loads of nitrogen by 10%, total phosphorus by 10%, TSS by 3%, E.coli by 8%, and turbidity by 15%***

- Implement BMPs on at least
  - a) 80% of crop land
  - b) 50% of pasture land
  - c) 5% of forest
  - d) 30% of feedlots

At this time there is no method to accurately determine whether or not this “Measure of Success” has been achieved. Ongoing evaluation will be necessary.

- These results at the end of the project period will show significant progress toward the overall goal of reaching water quality standards.

Future water monitoring using professional ‘lab’ methods will be necessary to accurately ‘ground-truth’ loads reductions in order to determine if water quality standards have actually been met, though significant reductions (as previously outlined in the previous “Outcomes and Measures of Success” have been recorded using calculation tools such as Region5, StepL, and other approved methods.

- ***Increased awareness of water quality concerns and conservation practices***

- 30% increase of knowledge of members attending shown through pre/post survey

At this time there is no method to accurately determine whether or not this “Measure of Success” has been achieved. Ongoing evaluation will be necessary. Pre/post surveys were administered but did not yield results that could be usefully analyzed as the results were too varied and survey participation was too low.

- Develop/distribute 6 newsletters/6 flyers/6 brochures

- Stakeholder meetings with 10% increase in annual attendance

As previously mentioned, Advisory Committee meetings did not see increased attendance for various aforementioned reasons.

- 7 press releases for cost-share program

- 2 stream/roadway cleanup using volunteers

- **Improvement in habitat scores by 5% (CQHEI) and an increase in macroinvertebrate scores by 5%**

- Improvement/increase verified through Riverwatch Monitoring activities

It is difficult to determine if a 5% increase in scores can be accurately assessed at this time without continued monitoring to be certain, though QHEI and PTI scores were quite good compared with other watershed projects. The PTI macroinvertebrate scores ranged from 11 (Fair) – 35 (Excellent), which QHEI scores ranged from 50 (Intermediate) – 65 (Good). No “Poor” scores were recorded.

## **Discussion of Monitoring Results**

All collected data was tabulated on the IDEM Spreadsheet provided at the time the QAPP was approved. This document can be found in **Appendix C** on the PCWP Final Report USB. QHEI scores were collected for each site and 3 macroinvertebrate assays were conducted. During the PCWP Implementation 319 project, samples were collected at 5 sites on 12 different occasions, though in some cases not all sites were sampled due to reasons described at length on pg. 10 “Lessons Learned”. No reliable results were obtained for Nitrogen samples (see pg. 8 “Lessons Learned”) and numerous other challenges were apparent, mainly due to issues stemming from the implementation of a monitoring regime that was an unfunded amalgamation of trend methods and futile attempts to collect quality data that exceeded the limits of available equipment and in-house resources.

At this time, and with data that is not wholly comparable to the standards and precision of the lab data collected during the Planning phase for the PCWP WMP, it does not seem prudent to make a full-fledged analytical assessment as to whether or not the trend monitoring data can definitively provide accurate information regarding improvements in overall water quality. It would be preferable to conduct monitoring in the future when adequate funding is available or to continue to collect Hoosier Riverwatch ‘trend’ monitoring data for a longer period of time. Perhaps more extensive monitoring can be conducted in the future, though until sufficient funding is available, it is best to reserve judgment/analysis at this stage.

However, based on general observation of the data results, there did not appear to be any significant deviations from the sampling information/data typically collected at these 5 sites. Of the 59 total E.coli samples collected, 41 were below 235 cfu/100mL while 18 exceeded the Water Quality Target, once as much as 1931.4 cfu/100mL. Higher E.coli concentrations were typically seen in the early summer months (June), though without consistent (and more frequent) long-term monitoring, it is difficult to determine if the BMPs implemented through 319 funding have yet had an effect on this parameter. Turbidity was elevated at all sites after rain events, as can be expected. Dissolved Oxygen registered at relatively normal levels (when the DO probe was not malfunctioning). The pH levels were normal throughout the 5 sites. Macroinvertebrate and QHEI scores were better than expected and an abundance of water pennies was recorded each year at site PC5 (furthest upstream).

There is no doubt that this watershed will greatly benefit from continued implementation and until better methods/tools are available for stream monitoring, the best gauge for improvement and WMP goal achievement is through the usage of pollutant load reduction modeling tools such as StepL and Region 5.

## **Public Participation and Partnerships**

The PCWP 319 Implementation program celebrated a successful outcome chiefly because of the dedication and commitment of those involved. The project was widely-promoted through avid word-of-mouth along with commitment from several avid Advisory Committee members. Many beneficial partnerships were formed or reinforced as a result of this project including Purdue Extension, Farm Bureau (Greene County), My Path (Owen County), Greene County Cattleman's Association, NRCS, The Nature Conservancy, Sycamore Trails RC&D, Bloomfield School System, Tulip Trestle Viaduct project, USFWS, Indiana Karst Conservancy, Richard Blenz Nature Conservancy, Fennig Equipment, several neighboring SWCDs, and many local contractors. Additionally, many helpful new contacts were made in the form of regional agronomists, seed dealers, contractors, and implement sales personnel. The NRCS CIT and District Conservationist were also instrumental in providing specifications, cost-estimates, and engineering plans for structural practices in the 319 program. Many local officials on the County Council and Commissioners are also directly tied to farming and were happy to learn more and do what they could to help advocate for the 319 program. The success of this project can largely be attributed to the Greene SWCD Board for their oversight and management of the 319 project.

One major credit to the PCWP Implementation program is the fact that the Match requirement was not only fulfilled, but exceeded! Indeed, the match requirement was \$186,655 and the final total reached \$196,171.27 exceeding the goal by \$9,516.27! This is a true testament to the commitment of local partners, producers, and volunteers. The momentum only continues to gain speed as the project rolls over into the PCWP Implementation II project!

## **Successes, Challenges, and Lessons Learned**

In summary, the PCWP 319 Implementation project demonstrated many positive efforts, including:

- Exceeded match requirement by \$9,516.27
- BMPs installed on thousands of acres
- Large load reductions achieved through Nutrient Management (Precision Ag.) and Cover Crops
- A variety of new livestock-related BMPs installed
- Over half of participants were newly engaged producers
- High level of participation from landowners and producers due to strong word-of-mouth promotion
- Cost-share funding completely obligated within the first year of the project
- 319 grant awarded for additional implementation in the PCWP watershed (2019-2022)
- Other conservation efforts including:
  - INField Advantage Middle Wabash group
  - Continued cross-promotion of NRCS/FSA programs

However, all roads to success often have a number of 'bumps' along the way. Below are some challenges the PCWP 319 Implementation project experienced (and learned from):

- Several engineering projects ran out of time to be completed before the grant deadline, due to weather delays, unforeseen circumstances, and over-ambitiousness on the part of some producers. Approximately \$30,000 worth of funding had to be utilized quickly in the remaining months of the grant, which made for a somewhat harried close-out, especially as several producers had difficulty turning in bills promptly. It would be best to be aware of this in the future and plan ahead accordingly (earlier construction deadlines, conservative workloads encouraged for first-time customers).
- Overlapping implementation grants can make meeting the number of obligatory field days, Advisory Committee meetings, newsletters difficult, as it is not possible to count a single event to meet the requirements of both grant agreements.



- Unfunded trend monitoring did not provide data that was comparable to the caliber of data collected during the planning phase (i.e. funded, lab grade) and was generally lacking in many ways.
- An abundance of promotional materials outlined in the grant application did not seem to be of great interest to local producers and were not necessary for promotion of the Cost-Share Program. Time invested in the creation of these materials did not offer equal ‘returns’ on investment.
- Resources and partnership opportunities are somewhat limited in this region at times so future 319 field days/workshops may require increased planning to be sure the events come to fruition.

## **Future Activity**

When it comes to the PCWP watershed efforts, the Greene County SWCD will continue to act as the backbone of the project, overseeing the completion of required tasks and handling all expenditures for the now ongoing PC Implementation II grant. The Greene County SWCD Board continues to look for opportunities to promote conservation in the region while facilitating ongoing implementation in the PCWP watershed. At this time, within 4 months of starting the second round of the Plummer Creek Implementation project, all funds have been completely obligated! It is highly likely that a third round of Implementation funding will be sought for Plummer Creek, especially as the WAIT LIST continues to grow. Additionally, the Black Creek watershed (western Greene County) is of interest as a future 319 Planning grant work area, pending a possible IDEM TMDL study; funding will soon be sought for this area, as well. The rapid and avid adoption of the Plummer Creek Cost-Share Program by local producers has provided much optimism when it comes to implementing BMPs and promoting widespread conservation methods in this area for years to come!

