

# Lyons Creek Watershed Project: Lessons Learned from Partner & Participant Reflections

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## Executive Summary

This report presents findings from a post-project evaluation of the Section 319-funded Lyons Creek Watershed Project to investigate the key factors associated with the low participation rate in the project, with the overall goal to inform future evaluations of current watershed projects and the development of new watershed projects. Two key questions informed the evaluation: 1) Why were more conservation and nutrient-reducing practices not adopted/implemented through Lyons Creek Watershed Project? and 2) What were the primary and secondary obstacles to landowners' and operators' adoption of conservation practices promoted by the project?

This evaluation utilized a qualitative study design to allow in-depth exploration of various dimensions of values, perceptions, attitudes and behaviors that may be related to decisions about whether or not to participate in the Lyons Creek Watershed Project (LCWP) and knowledge about project implementation and perceived challenges to the implementation. The first phase of the evaluation included twelve telephone interviews with 1) partners / stakeholders who were tasked with promotion and support of the LCWP including the LCW project coordinator and designated members of the Iowa Soybean Association and the Nature Conservancy, 2) DNR Staff, and 3) other cooperating agencies, groups and individuals knowledgeable about agricultural practices within the watershed. This first group is referred to as "Key Informants." The second phase of the evaluation included face-to-face, in-depth interviews with eighteen landowners and operators from the Lyons Creek Watershed (herein referred to as "Farmers").

The current study was proposed to better understand how the Lyons Creek Watershed Project was implemented, identify its perceived strengths and its perceived weaknesses and gather input about features of projects that are important to those implementing and those who are sought to participate. Application of these findings can strengthen future projects -- resulting in greater farmer participation and ultimately, greater success in improving water quality.

The themes that emerged from the interviews with the Key Informants (KI) fell into three overarching categories – general views of the project's strengths and weaknesses, perceptions of barriers to farmer engagement, and suggestions for improving future projects.

### **Key Informants - General Views of Project Strengths and Weaknesses**

KI-1: The LCWP was viewed as having limited success which peaked early in the project.

KI-2: There was no shared understanding of project goals or criteria for success.

KI-3: The organizational partnerships brought together through the LCWP were deemed a major strength of the project.

KI-4: Increasing practical knowledge of conservation practices or landowner/operator's knowledge of their own soil and water was viewed as an important component of the project.

KI-5: The LCWP would have benefited from a full-time coordinator with a broad skillset serving the entire project period.

KI-5a: Some stakeholders perceived that the LCWP communication and coordination among partner organizations was not maximized, or utilized to its fullest potential.

KI-5b: Project partners may have received and/or conveyed mixed messages about various aspects of the project.

### **Key Informants – Perceptions of Barriers to Project Engagement**

KI-6: Water quality was not viewed by key informants as a major concern among farmers in the Lyons Creek Watershed.

KI-7: Resistance to change was evident and was magnified by historically high prices (at the time of the LCWP) that emphasized yield concern over LCWP participation.

KI-8: The complex and sometimes competing views of landowners versus a cash-rent operator created both real and perceived barriers to implementation.

KI-9: Adjacent, concurrent, and/or overlapping programs muddled the identity of and opportunities available to landowners and operators through the Lyons Creek Watershed Project.

KI-10: Passive recruitment strategies may have lessened the reach of the project.

### **Key Informants – Suggestions for Improving Future Projects**

KI-11: Farmer input and buy-in should be sought early and would strengthen future projects.

KI-12: Increased focus on data, follow-up, technical assistance and practical demonstrations would improve the success of future projects.

KI-13: A shift to longer-term thinking for watershed projects would yield greater engagement.

KI-14: Incentives are necessary but may not be sufficient to drive long-term change.

KI-15: Reframing water quality challenges to lessen “blame” could decrease resistance to new practice adoption.

The main themes that emerged from the interviews with the Farmers (F) were broadly related to four categories – general views of the Lyons Creek Watershed and water quality, perceptions of the relationship between farming practices and water quality, LCWP project knowledge and views of most valuable components, and barriers to participation in the LCWP.

### **Farmers -- General Views of the Lyons Creek Watershed and Water Quality**

F-1: There is limited awareness of the location of the Lyons Creek watershed.

F-2: Good water quality in the Lyons Creek Watershed is important.

F-3: Water quality is viewed by many farmers as better than in previous generations and is strongly associated with visible characteristics of the water.

### **Farmers – Perceptions of Relationship between Farming Practices and Water Quality**

F-4: Farmers associate specific management practices with improving water quality.

F-5: Nitrogen use is appropriate to agricultural need and naturally constrained by economic concerns.

F-6: Poor water quality is impacted by sources beyond crop production.

F-7: There is skepticism about the negative impact of applied nitrogen and the attempts to mitigate the levels in waterways.

### **Farmers -- LCWP Project Knowledge and Views of Most Valuable Components**

F-8: General awareness of the Lyons Creek Watershed Project was present and generally positive but farmers had little specific knowledge of project goals, funding availability, staff recognition or the extensive partner network.

F-9: Project participation offers a means of inoculation against more criticism of and possibly more regulation of farming practices.

F-10: Increasing practical knowledge of conservation practices or landowner/operator’s knowledge of their own soil and water is valuable.

F-11: Having a “champion farmer” within the Lyons Creek Watershed early in the project time period lent credibility and visibility to the project.

## **Farmers - Barriers to Participation in the LCWP**

F-12: Change is difficult.

F-13: Focusing more on landowners and nuances of their relationship with operators could improve the adoption of new practices.

F-14: The conservation practices (promoted through the LCWP) were viewed as having high costs relative to benefit or as being incompatible with their current farming approach, leases or soil conditions.

F-15: The project incentives encouraged participation but did not outweigh perceived economic risks for many farmers.

It is important to note that this study was qualitative in design and represents the perceptions and views of those interviewed. These may not be representative of those from other projects and areas or even other farmers in Hamilton County.

## Table of Contents

|  |    |
|--|----|
| Executive Summary.....                                   | 3  |
| Table of Contents.....                                   | 7  |
| List of Figures .....                                    | 7  |
| List of Tables .....                                     | 7  |
| Background .....   | 8  |
| Methods.....   | 9  |
| Findings .....   | 14 |
| Perspectives of Key Informants .....                     | 14 |
| Perspectives of Farmers (landowners and operators) ..... | 32 |
| Summary .....  | 49 |
| Conclusions and Recommendations.....                     | 51 |
| References .....   | 52 |
| Appendix A. Phase 1 Key Informant Interview Guide.....   | 53 |
| Appendix B. Phase 2 Farmer Interview Guide .....         | 55 |
| Appendix C. Phase 2 Demographic Questionnaire .....      | 61 |

## List of Tables

|   |    |
|---|----|
| Table 1. Demographic information for Farmers..... | 12 |
|---|----|

## List of Figures

|   |    |
|---|----|
| Figure 1. Map of Lyons Creek Watershed..... | 13 |
|---|----|

## Background

Iowa is a state with high risk from sediment, nutrient, and toxic stressors that result from extensive cultivation, confined animal feeding operations, and moderate levels of atmospheric deposits--in particular sulfuric and nitric acids in precipitation--impacting large portions of the state (Brown & Froemke, 2012). Work to improve water quality at the watershed level almost always includes the participation of landowners and operators in management practices designed to reduce contaminants, runoff, and erosion. Success of watershed projects using best management practices (BMPs), such as water and sediment control basins and plantings on highly erodible land, has been documented at various locations in Iowa (e.g., Schilling et al., 2007; Gassman et al., 2010) and elsewhere in the US (Collins & Gillies, 2013). Arguably, the success of such initiatives often hinges on engagement and participation by the local landowners and operators.

The current study was proposed to better understand how the Lyons Creek Watershed Project (LCWP) was implemented, identify its perceived strengths and its perceived weaknesses and gather input about features of projects that are important to those implementing and those who are sought to participate. Application of these findings can be used to strengthen future projects -- resulting in greater farmer participation and ultimately, greater success in improving water quality. This information was gathered using qualitative in-depth interviews with key informants (LCWP staff and organizational partners) and with farmers (operators and landowners). Findings from this study extend this body of work focusing on landowner/operator attitudes and motivations and seeks to provide important insights for bridging differences across viewpoints and priorities. The findings will help identify common ground that can motivate and inform local and regional environmental planning that is even more cooperative and successful in its efforts to improve water quality in the state of Iowa.



## Methods

*Study Design* A qualitative study utilizing semi-structured, in-depth interviews was used to explore perceptions, opinions, and attitudes surrounding the implementation of the Lyons Creek Watershed Project. The location of the watershed is shown in Figure 1. In-depth interviews provide context to other information (such as lower than expected participation, shortfalls in achieving programmatic goals, etc.), offering a more complete picture of what happened in the program and identifying key desirable components and challenges or barriers to its successful implementation. Collaborating with DNR staff, CSBR staff conducted two phases of interviews. In Phase 1, in-depth telephone interviews were conducted with 1) key informants and stakeholders who were tasked with promotion and support of the LCWP and designated members of the Iowa Soybean Association and the Nature Conservancy, 2) DNR Staff, and 3) other cooperating agencies, groups and individuals knowledgeable about agricultural practices around the watershed. In addition to the interviews, activity timelines and any relevant documents (e.g., emails or project promotion materials) were reviewed to assist in development of interview guides and better understand the participants' responses. The second phase of the evaluation included face-to-face, in-depth interviews with eighteen landowners and operators from the Lyons Creek Watershed.

*Recruitment* Participants for the Phase 1 interviews were recruited by email invitation with follow-up by telephone from a list of contacts compiled by DNR staff of key personnel and project partners. For Phase 2 recruitment, a listing of farmers and landowners residing in the Lyons Creek Watershed was provided by DNR and a letter of invitation describing the study and requesting participation in the interviews was sent to all landowners and operators in the Lyons Creek Watershed. Publicly available telephone directories and county plat books were used to supplement the information on the list related to undeliverable addresses and missing or nonworking telephone numbers. CSBR staff called landowners and operators one week after mailing the invitation letter to schedule an interview. In addition, snowball sampling was utilized wherein farmers interviewed were asked to pass on a postcard with study information to fellow landowners and operators in the Lyons Creek Watershed. Postcards were also handed out in-person by CSBR staff at establishments frequented by farmers such as coffee stops and farm cooperatives (co-ops). All Phase 2 participants received a \$50 gift card per household to compensate them for their time.

*Materials* For both phases, a semi-structured interview guide was developed to elicit information about the Lyons Creek Watershed Project, perceptions of key desirable components and challenges or barriers to project participation, and suggestions to increase success of future watershed projects in general (Appendix A – Phase 1 interview guide; Appendix B – Phase 2 interview guide). The interview guides contained approximately 10 to 30 questions, respectively, and probes were included for each question to explore topics thoroughly and to facilitate meaningful conversation. A brief demographic

profile was also included to summarize the characteristics of Phase 2 participants (Appendix C - Demographic questionnaire).

*Data Collection* A total of twelve Phase 1 interviews were conducted by telephone between January 11, 2016 and February 24, 2016 and ranged from 30-45 minutes in length. In Phase 2, eighteen interviews were conducted either in-person or by telephone between February 15, 2016 and March 28, 2016 and ranged from 60-90 minutes in length. Informed consent was obtained from participants prior to conducting the interview by verbal consent in telephone interviews and signed consent for in-person interviews. Interviews for Phase 1 were conducted by Erin Heiden and Mitch Avery, and interviews for Phase 2 were conducted by Neal Pollock and Andrew Stephenson. The interviews for both Phase 1 and 2 were audio-recorded and transcribed verbatim for use in analysis. The study design, interview guides, and informed consents were approved by the Institutional Review Board at the University of Northern Iowa.

*Analysis* The framework approach for analyzing qualitative data was adapted to identify major themes in the data that emerged from the content of the interviews. The interview data were analyzed on the basis of systematic coding, following the approach detailed by Saldaña (2009). This type of analysis consists of systematically breaking down data into codes in such a way as to identify relevant clusters and patterns. The codes are then grouped and synthesized into (more general) categories, which in turn are aggregated into more general themes and concepts arising from the interview responses. The analysis was carried out using a combination of deductive and inductive coding (also called "hybrid" coding, cf. Fereday & Muir-Cochrane 2006). The deductive codes and categories were generated in part from the specific focus areas of interest that were utilized in the interview guides. Using team coding, all four interviewers reviewed a selection of Phase 1 and Phase 2 transcripts to familiarize themselves with the information from both phases of interviews. The transcripts for each phase were then coded by their respective interviewer pairs. The code system (and the categories and themes that were developed on the basis of the coding process) was developed gradually and collaboratively among the interviewers along with additional staff who reviewed the findings and categories to allow for additional confirmation and corroboration of categories and themes outlined in this report.

It is important to note that findings are based on qualitative interviews with a small number of individuals. There may be implied measurement properties of qualitative data when descriptions such as "most", "several", or "a few" are used. However, this is not an appropriate interpretation of qualitative findings. The authors aimed to be mindful when using these descriptive qualifiers, so as not to imply a quantitative assumption about the findings. In all cases, descriptions such as "most" or "a few" simply mean the view or perspective was not unanimous (i.e. it was neither held by "none" nor "all"). Caution should be used to avoid inferring a quantitative inference from statements that use these descriptions.

*Participant Profile* To protect the identities of the participants, individuals participating in the Phase 1 interviews are not included in a profile. Participants of Phase 2 interviews were asked to provide demographic and background information about themselves. Most were male and most farmed land that was a combination of owned (by them) and rented from another landowner. One interviewed landowner did not farm (Table 1).

Table 1. Demographic information for Phase 2 participants

|   | <b>n</b> |
|---|----------|
| <b>Gender*</b>  |          |
| Male  | 16       |
| Female  | 3        |
| <b>Education</b>  |          |
| High school graduate or less  | 5        |
| Some college, but did not finish  | 4        |
| Two year college or associates degree (AA/AS)                               | 3        |
| Four year college or bachelor's degree (BA/BS)                              | 6        |
| Graduate college of professional degree                                     | 1        |
| <b>Rent or own farm land</b>  |          |
| I rent all of the land that I farm  | 5        |
| I own some of the land that I farm and rent<br>some of the land that I farm | 11       |
| I own the land, but do not farm   | 3        |
| <b>Total acres farmed</b>   |          |
| 250 to 499 acres  | 3        |
| 500 to 999 acres  | 4        |
| 1,000 or more acres   | 9        |
| I do not farm   | 3        |
| <b>Total acres owned</b>  |          |
| Less than 50 acres  | 2        |
| 50 to 99 acres  | 5        |
| 100 to 249 acres  | 4        |
| 250 to 499 acres  | 2        |
| 500 to 999 acres  | 3        |
| 1,000 or more acres   | 1        |
| I do not own land   | 2        |

\*One Phase 2 interview was conducted with two individuals simultaneously, one male and one female.

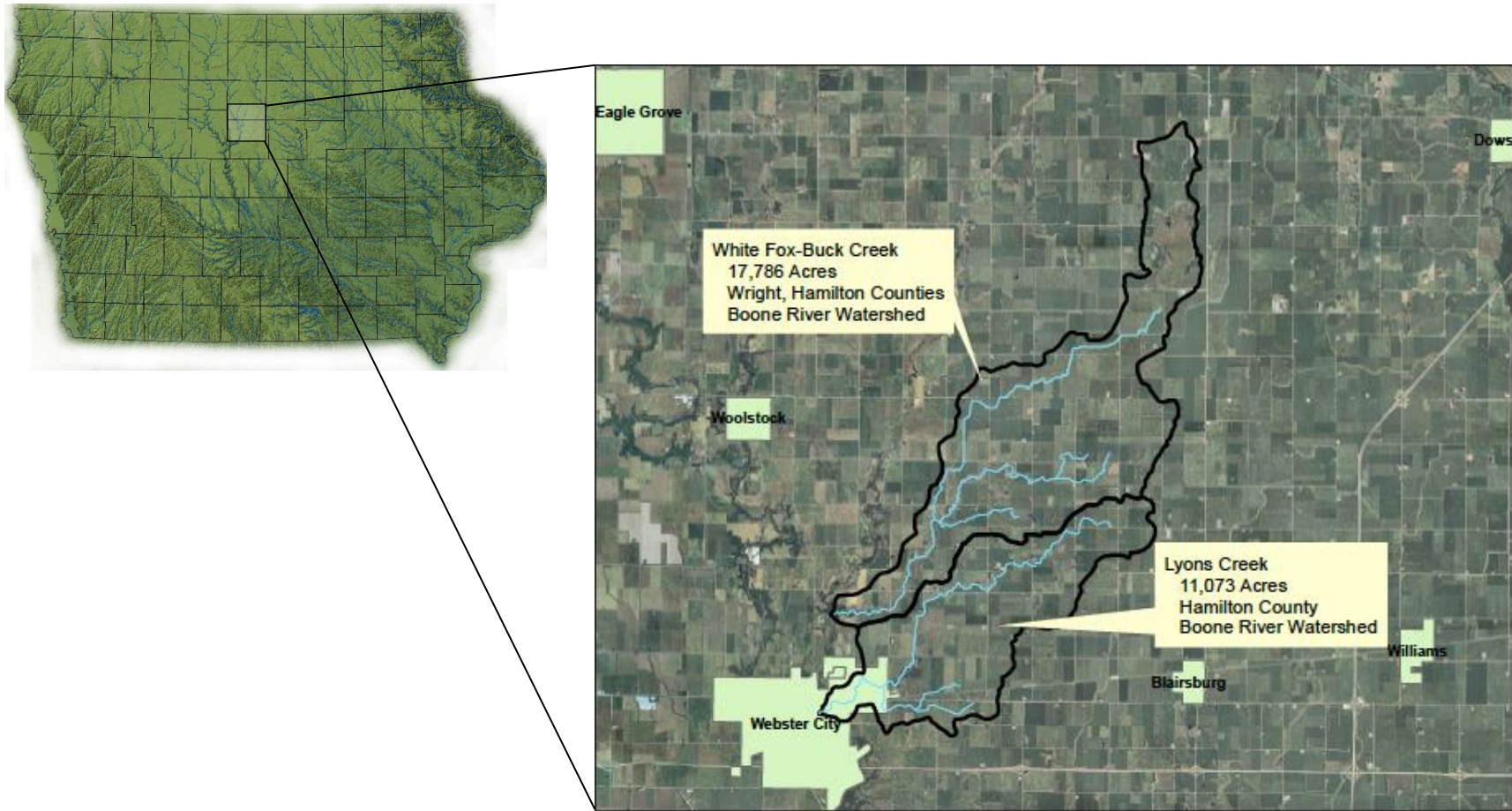


Figure 1. Map of Lyons Creek Watershed

## Findings

A number of key themes and subthemes emerged from the interviews. These are presented below structured within sections that identify overarching themes identified for both the project implementation key informants (KI) (both project staff and partners) and the farmers (F) (both operators and landowners). Quotes listed to support the themes were made by individual key informants and farmers.

### Perspectives of Key Informants

The themes in this section fall into three overarching categories – general views of the project strengths and weaknesses, barriers to farmer engagement, and suggestions for improving future projects.

#### ***General views of project strengths and weaknesses.***

##### **Theme KI-1: The LCWP was viewed as having limited success which peaked early in the project.**

Overall, there were mixed perceptions of success among staff from both the LCWP and project partners. A few individuals thought that the project was indeed a success, focusing primarily on the practices that were implemented on the ground rather than on any measures of impact or a threshold for a specific number or proportion of participants actively engaged in practices advocated by the project.

*That [working with partners] made the project a success.*

*So I think that was successful in the fact that additional practices got put out there. And some people may quibble with this but I'm more of the opinion that even if conservation might be better applied in a particular quadrant of section, the fact that it's applied at all anywhere, I think, is an important piece.*

*...we were able to meet our goals and so that would be a measure of success.*

*It was absolutely a step in the right direction.*

More often, staff from the project or partner organizations reported that the LCWP was a mixed success. Most felt the number of practices implemented on the ground was not adequate to call the project a success, however, the increased awareness of conservation practices among the target population was viewed as a small measure of success.

*...Lyons Creek had implementation and practices and farmers engaged, but did they reach where they needed to be at this point? I think they've fallen a little short. So, I think there was a great early success, a great early momentum, but then it stalled.*

*I wouldn't say it was very successful if you look solely at the amount of practices that were implemented on the ground... the project did bring together a stronger partnership of folks that were willing to work together and develop a plan but when it came to getting things built or getting things established on the ground with farmers or landowners, success was pretty limited.*

*I would say it was low to moderately successful. Just I would have liked to see a higher implementation rate of some of the practices. It seemed like there was some low participation at times and while there wasn't an effort to not do anything, it just seemed like there wasn't a lot of motivation for people to do things.*

*I would say it wasn't as successful as it could have been. I think there were successes but overall I don't know if you look at the money spent if you would say it was a success...I think there was successes to it but maybe not an overall success.*

*I do sense from the coordinator that there is a feeling from that person that goals were being achieved when reality is that what was being achieved was pretty minimal in the grand scheme of things.*

A few staff and project partners generally felt the LCWP was not successful and one key informant reported having never seen a summary of the project activities and therefore, was not comfortable commenting on the success of the project.

*I don't think we got the level of adoption that we wanted to see. We didn't get the percentage. We felt like we needed to get specific percentages of coverage in the watershed of certain practices to be able to even start to see any change in nutrient export and so we did not get those rates of adoption completed.*

*I would, I mean, really I would rate it as unsuccessful. There was a lot of funds that didn't get used and I don't know what other incentive you could offer to landowners... So yeah, on that front it was not so good.*

*I've never seen a summary of anything that's happened in that watershed project.... I obviously cannot [rate the overall success].*

**Theme KI-2: There was no shared understanding of project goals or criteria for success.** There was inconsistency in the views of key informants regarding the expectations and perceived measures of success. In other words, what one person defined as “successful” often did not align with what another viewed as a metric of success. Some staff and project partners had particular implementation targets in mind, ranging from any implementation at all to approximately 40% of the available acreage signed up for practices to be able to consider the project a success. Others pointed to a certain participation rate (i.e. proportion) of farmers in the watershed as the metric of success, and still others stated that

improvements in education and relationship building were the key measures of success for LCWP (versus implementation rates as a proportion of available acreage or landowners/operators in the watershed).

*...in terms of acres or percentage of the watershed, yeah, we were targeting 30 to 40 percent, I would say, of the acres being implemented in something.*

[Interviewer: What would you have expected to be a reasonable either number of producers or a percentage of producers to have signed up through this project for Lyons Creek?] *Yeah, maybe 40 percent or so.*

*I see the watershed plan as sort of a longer-term vision but if enough practices can be implemented in a short amount of time to detect a positive change, I think that would be good enough...*

**Theme KI-3: The organizational partnerships brought together through the LCWP were deemed a major strength of the project.** Despite the lack of consensus about the success of the project or the criteria for success, practically all of the key informants identified the partnerships created around the LCWP as a major strength of the project. The project brought together public and private partners from multiple sectors who each had expertise in a particular area of the project.

Most said the biggest strength was bringing a large group of stakeholders together to support each other in this effort. Secondly, it was perceived that partners helped expand the reach of the program and opportunities to talk to potential LCWP participants. The partnership was also seen as a significant contributor to opportunities for partners to share or offset costs with supplemental funding for LCWP activities when parameters of the program did not support all costs, such as when purchasing food for informational meetings.

*...here you had an ag organization working with the DNR, local NRCS Office and the District's, all coming together to work for a common goal of developing the watershed plan to improve Lyons Creek. I thought that process went very well.*

*...I think that was the strongest thing about this project is the partnership that was willing to support the project.*

*I'd say all the partners were great. Without them, like I said before, we wouldn't have went near as far without the partners. For example, our project we could not with a 319, when we had a field day we could not provide food and there's other things we couldn't do. Well, luckily, for the partners, they could do that.*

**Theme KI-4: Increasing practical knowledge of conservation practices or landowner/operator's knowledge of their own soil and water was viewed as an important component of the project.**



Demonstrations and practical, first-hand knowledge of how to implement the practices promoted through LCWP was reported by most staff and project partners as a facilitator to adoption of conservation practices among the target population.

*...farmers really appreciate data and feedback. At least from the ISA perspective, we were able to provide them water monitoring data. We did on-farm research up there, stalk sampling, so they all appreciated the feedback they were getting.*

*...the farmers really liked the data that they could see about their farm or about their water leaving their farm. I think farmers liked innovative practices. They liked trying new things like a saturated buffer or hearing about bioreactors. I think they enjoyed the data and new ideas.*

*In our experience with any farmer, whether it be Lyons Creek or any other watershed information and data is important for them. When you are asking a farmer to make a change and adopt a practice, they're also taking on the risk of that practice either working or failing, and this is their business. So, farmers really like to make a sound decision and to do that they want some data and science behind it.*

*You know, often that was, if we had them timed right, if we had them at a time when farmers felt like they could take the time to come, I think that opportunity was always appreciated, especially if we were doing like a cover crop seeding demonstration or something really hands-on or if we were having another farmer demonstrating or just even talking about their success, talking about the logistics of the practice, the details of the equipment they're using, that sort of really practical knowledge seemed to go over well.*

*There's a lot of help out there but they still need somebody to say yeah, this is really the kind of mix that you want to put, here is the seeding rates, here are some options for that.*

The use of a "champion farmer" to help demonstrate practices and allow testing of new equipment was viewed as a key asset of the project.

*...we had a good, we'd call maybe champion farmer type, that was doing some of these practices and really promoting them. He believed that they were a good way to reduce nitrogen and to save money on his farming operation. And he was in the area and he was real helpful with that. He had good rapport with the farmers and good credibility.*

*[Champion farmer] was brought in as a resource and held some field days and actually loaned some equipment out or allowed some equipment to be used in the watershed to*

*try some different things because obviously that's a barrier too. If you're asking somebody to make a change that requires a change in equipment and implements then that's a large cost, upfront capital cost, and if they're not sure it's going to work. So [champion farmer] allowed one of his pieces of tillage equipment to be loaned out so they could try it without having to invest in it quite so much.*

**Theme KI-5: The LCWP would have benefited from a full-time coordinator with a broad skillset serving the entire project period.** The project coordinator position for the LCWP was a part-time position. The individual who held the position for the longest tenure coordinated two concurrent, half-time watershed projects. Staff and project partners indicated that the part-time position, and turnover of the position early in the LCW project period made it difficult for the project coordinator to build relationships with farmers. Splitting time across the two watersheds may have negatively impacted the project coordinator's recruitment efforts in the Lyons Creek Watershed. Multiple staff and project partners noted the difficulty in building rapport with farmers when the project coordinator position was part-time or had turnover, both of which occurred in LCWP.

*...sometimes it's difficult in watershed projects where you have watershed coordinators who are around for one-year or two-year or three-year projects and they're just not someone that the farmers necessarily are familiar with but that's not always the best, the most trusted resource.*

*...[the position] was also part-time in [another county] in a project there. So there was two watershed projects and two – [the PC] was part-time in both and that made full-time then with both.*

Multiple staff and project partners described a broad skillset desired in an ideal candidate for the LCWP project coordinator position. The ideal candidate would have knowledge of conservation practices, knowledge of farming practices and culture, scientific knowledge related to agronomy, and sales skills. All respondents acknowledged the difficulty, and perhaps unrealistic expectation that a single person would have the full complement of skills needed. Most reported that the project coordinator had adequate skills for one-on-one recruitment. Others identified gaps in technical knowledge, administrative skills, and/or subject-matter expertise. These views centered on the desire for more reporting/project management skills and sales skills and the challenge of an individual having to learn some aspects on the job within the project's finite time period.

*There's pretty high expectations for these coordinators...I don't know that there is ever a right person for these jobs just because the expectations are so high and the pay and benefits and support is minimal.*

*[Project Coordinator] was kind of learning agricultural stuff and practices as he went so in the initial stages he was probably learning more. He was probably learning as he was going and, as he was talking to people, he was learning at the same time. So I think that's not necessarily a bad thing but when you've got a three-year funding period...*

*[Project Coordinator] was very, very good at talking with the farmers and just doing the one-on-one stuff but then as far as like the follow-up and like all of the financial stuff and the reports and pretty much everything else that goes along with managing that and seeing the project through, a lot of the technical stuff he was not very good at.*

*I think it needs to be a sales-type job but we have so many scientific expectations or writing expectations or otherwise that we don't get the people that are truly good at sales or willing to put themselves out there in front of someone they don't know and try to convince them to do something differently.*

*...a lot of these folks have an environmental or a biology or some sort of science background, but being a coordinator is as much about sales as it is anything else. I've been to a lot of watershed leadership type conferences and meetings and I hear that, about these folks needing some sales skills, you know, how to sell something. When you meet with a farmer, you can talk about the issues, but we're actually selling a product, in this case a practice, what's the salesmanship skills like?*

***Subtheme KI-5a: Some stakeholders perceived that the LCWP communication and coordination among partner organizations was not maximized, or utilized to its fullest potential.***

While partnerships were considered a strength by most respondents there were concerns from some that additional partners were needed and that the existing partners were not maximized in the LCWP. Agronomists, local and university-affiliated, and local resources, such as co-ops and equipment dealers, were identified by some respondents as missing partners due to their expertise and local connections, respectively.

*[Local partners] have a much more solid and long-lasting relationship with the farmers in those watersheds than the other people do because they live in those communities, right? They live in those communities, they work in those communities, they go to church in those communities, there's a bunch of social relationships there, and that can really be explored and be taken much more advantage of by bringing your partners to the table. Not just bringing them to the table but getting them engaged.*

One partner did not feel as though they were a true partner. Due to a lack of timely communication with LCWP staff, they were not able to participate in project activities outside of meetings. They

reported being surprised when project activities arose since they indicated they had little, if any, prior knowledge or advanced notice of the events. They also reported that they had never seen a summary of the project or its activities. This disengagement with watershed projects was not unique to LCWP, however and partners reported similar experiences with other watershed projects. This led to frustration on their part because they were not able to share their expertise or be involved in recruitment.

*We should be kept apprised of all activities going on in the watershed if we're supposed to support those efforts which we are ... we should probably talk about results and outcomes of any practices being implemented, water quality testing being done, and so forth, and that does not happen in a formalized fashion. I would say that very rarely happens, to be honest.*

*...one of the frustrating things, at least for me, is you have a quarterly meeting to discuss what's going on in the watershed projects and then all of a sudden like three weeks later you find out there's going to be an event of some kind that was never discussed at the quarterly meeting three weeks earlier.*

This lack of formalized coordination with the partners was corroborated by additional respondents. Some respondents attributed the lack of coordination to the sheer number of partners involved in LCWP, others to a perceived lack of regular partner meetings, despite them occurring quarterly, and others attributed it to insufficient project coordination. In general, there was a perception that the project would have benefited from more coordinated assistance from project partners in recruitment and engagement activities.

*Lyons was a challenge because of the numerous partners that wanted to be involved which I think kind of lengthened the project some. You know, is that good or bad? It's hard to say. You always want any additional partners to bring additional resources but it also brings additional challenges. Maybe how that was managed might have been done a little differently.*

*I think there's opportunities to align the partners better. Even though it's a great, or people perceive it as a great partnership, I think there's opportunities to better align what each individual partner brings to the table.*

*...a partner meeting or a yearly partner powwow might have provided an opportunity to communicate those results or at least the activities in a way that would make all partners feel like they knew what was occurring and some of the information that was being gathered to be able to understand what that information was telling them.*

**Subtheme KI-5b: Project partners may have received and/or conveyed mixed messages about various aspects of the project.** There was a sense among staff and project partners that potential project participants were receiving mixed messages about the project's activities, funding, and practices. This was likely confounded by the perceived shortfalls in communication and coordination. Importantly, this was not an issue raised by the farmers.

*...when you're working on a watershed project and you don't have all of the entities or folks that make decisions or help make decisions there discussing it, that the messaging can get mixed.*

*...there might have been some misguided information that was shared with farmers based on practice dollars, practice availability, what could, what couldn't be done. I was always frustrated with that part.*

*...trying to get like agronomists and others all on the same page so we could implement practices. Sometimes an agronomist might have had an opinion about a cover crop not performing well and would recommend against it. Obviously that's the opinion they're sharing with their farmer. I did think it at times may have posed a problem on more rapid adoption of practices.*

*...if [partners] haven't been involved in the discussion or have the current research or information then they may be hesitant to adopt a practice or tell their customer to adopt a practice.*

### **Perceptions of Barriers to Project Engagement**

**Theme KI-6: Water quality was not viewed by key informants as a major concern among farmers in the Lyons Creek Watershed.** There was a perception among some staff and project partners that water quality may not have been a salient issue to farmers in the Lyons Creek Watershed.

*I would say that producers probably didn't perceive that they had a problem with it, that there was a water quality problem.*

*I think maybe [landowners/operators] need to see that they in particular are also part of the problem. A lot of them think oh, that's my neighbor down the road or that's the big water treatment facility, that's not me.*

*...I'm not always sure that farmers and landowners had an in-depth enough understanding of what the issues were in the watershed. I mean, I think we always felt like that was clear to them but I'm not sure that they had actually adopted the*

*watershed issue as their own issue as farmers, do you know what I mean? Like I don't know if they were identifying with those problems totally.*

**Theme KI-7: Resistance to change was evident and was magnified by historically high prices (at the time of the LCWP) that emphasized yield concern over LCWP participation.** Key informants saw evidence that farmers were resistant to change -- some identifying the record high corn prices at the time as having a negative effect on practice adoption.

*I think on the one hand one of the things that happens is that people believe the rhetoric so I think if they're told they don't have to do this stuff and that it's a bunch of hogwash then they don't do it and that's what they think about it. And it's easier to believe some of those things than to change. Change is hard.*

*I think there's always a little concern there or hesitation because it is their livelihood and they don't want to, you know, it's some risk that they feel, especially when the commodity prices and the margins are pretty slim, you know, it's hard to get them to take that risk sometimes.*

*...was at the time very high corn prices and bean prices so the relative risk to try a new practice even with the yield guarantees with the small amount of yield loss, you're still talking about a lot of money. They were very high amounts when you're looking at the margins on things like yield drag and experimenting with practices that could reduce yield.*

**Theme KI-8: The complex and sometimes competing views of landowners versus a cash-rent operator created both real and perceived barriers to implementation.** There were two primary groups of potential participants for the LCWP. First, the farmers or operators of the land and second the owners of the land. Some farmers owned their own land, others rented, still others were a combination of the two. Some landowners were engaged and active in their farm's business while others were absentee landowners. These complex working relationships presented additional challenges to implementation.

*We did find out those were two distinct groups that had different goals and not necessarily the same goals so trying to work with the operators, you may have their support but if you don't have the landowner support then it goes nowhere.*

*...trying to get the landowners involved as much as the operators and that can be tough because a lot of them are absentee and don't live around here and a lot of them aren't very engaged and a lot of them don't see a reason to interact, it didn't seem like, with something like this.*

*I think especially when I first started I always thought, well, the landowners, they would have the longest-term, kind of longest view over that land and that soil but that was not necessarily always the case. Sometimes it was the farmer that was really interacting with the land on a daily basis that cared more about soil quality and reducing inputs and all of those details.*

*We have farmers that are farming land that they don't own and farmers that are farming land that they do own and then you have some landowners that are really involved with the day-to-day farm operation and other landowners that are less involved. And so I think that really made a difference to farmers in terms of how, you know, sometimes how willing they were to sign a contract and get funding to do a conservation practice...*

The financial incentives offered through the LCWP may have created some tension between renting farmers and landowners. If a landowner wanted a cut of the incentive funds, the benefit to the farmer would be lessened, potentially influencing adoption rates.

*...there was enhanced payments for some of these conservation practices so there was incentives for the producer to do these but then when they had to get the sign-off from the landowners, then the landowners wanted a piece of that money as well, so then that kind of diminished the value that it was going to provide to the operator when they had to give some of that up to the landowner.*

*...we had one farmer in particular that was really hesitant from the beginning because he felt like if he was getting federal funds, federal or state funds, to try a practice and then his landowner found out about that that the landowner would want a cut of those incentive payments. So yeah, sometimes there was, just depending on the relationship between the farmer and landowner, sometimes that was kind of an important distinction of who was making decisions.*

**Theme KI-9: Adjacent, concurrent, and/or overlapping programs muddled the identity of and opportunities available to landowners and operators through the Lyons Creek Watershed Project.**

There were multiple ongoing projects, each with its own source of funding, that occurred just prior to and/or concurrent with the LCWP. Phase 1 respondents identified the following overlapping funding sources: LCWP (also referred to as the 319 grant), Mississippi River Basin Initiative (MRBI), Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Conservation Stewardship Program (CSP), Agriculture's Clean Water Alliance (ACWA), as well as private funding through foundations. The multiple sources of funding were seen as a boon to the projects, as project staff were able to 'piggyback' off each project's funding, thus making each project's dollars go further.

Project administrators were also able to reallocate funds from one practice to another based on the perceived demand for a practice. This was seen as a benefit by some because it allowed flexibility in meeting the demands of the participants and did not tie funding to practices that were non-starters.

However, while project staff generally identified the ability to cross funding streams and adjust funding mid-stream as benefits, some staff members thought the funding structure might be confusing to participants. If funding for one project or practice runs out it may not be clear that there are other opportunities for funding. Additionally, one staff member indicated that payment rates for a practice changed over the course of the LCWP. With so many aspects of funding in flux, these factors may have also been a source of confusion for both farmers and project staff, multiple project staff identified their own or other's confusion, regarding project funding opportunities.

*...some of the people we piggybacked some of the programs like we did some basic funding through EQIP and we topped that off with some of the funding from the Lyons Creek and it kind of helped the funding for both the projects go a little bit farther.*

*I think there was some confusion about where the funding was coming from and I think there was some that they didn't particularly care if it was Lyons Creek funding or MRBI funding as long as they got funding and there was some of that.*

*There were specific 319 dollars or specific watershed plan dollars available, but then there was also outside funding that was available. I think that locally became confusing to individuals implementing the project on dollars that might have been available.*

*We had [MRBI] going on at exactly the same time and so some of the people who were in Lyons Creek actually did some things through MRBI and they may or may not have gotten reported through Lyons Creek.*

**Theme KI-10: Passive recruitment strategies may have lessened the reach of the project.** Most individuals interviewed in Phase 1 identified an assortment of project recruitment activities. Despite the numerous activities, there was a perception among some key informants that these efforts were too passive. Several respondents reported that the promotion relied upon producers expressing an interest in a practice, then walking them through the program(s) available. This created a belief among some staff and partners that the project simply connected with those farmers who were already predisposed to participate in conservation efforts and not the hard-to-reach, or more risk-averse producers.

*I always thought that [THE STAFF TOOK MORE] of a passive approach than an active approach where they would wait for the work to walk in the door, and then go out and seek the implementation that was needed.*



*...there wasn't a lot of promotion locally and it relied more on people expressing an interest and then maybe going to a local office or staff person to see how they could participate in the project...*

*There needs to be more cold calling and relationship building with non-participants and I didn't feel like that had occurred with this watershed.*

*...I feel like they probably reached some people that might not have been active conservation program participants before but I think to a large extent we reached the choir and, not that that's a bad thing but I'm not sure we reached beyond the choir which was really something that I kind of tagged to the goal of the project was to reach beyond and have it be farmer-to-farmer, you know, spread farmer-to-farmer...*

*...everybody did as much as they could do to encourage new people to participate but a lot of the people that showed up were people that had already been participating in the program and everybody kind of lamented that the people that hadn't participated yet weren't there, weren't involved.*

### ***Suggestions for improving future projects.***

**Theme KI-11: Farmer input and buy-in should be sought early and would strengthen future projects.** Project staff would have liked to involve farmers during the planning process for the LCWP and suggested doing so for future watershed projects. The project implementation could benefit from the farmer's firsthand knowledge of the land and community insight by tailoring the project's approach to recruitment, promotion, and help determine the conservation practices that would work best in the area. Early involvement of farmers may also encourage community ownership of the project, enhance recruitment efforts, and increase practice adoption rates.

*One of the problems that I think exists with Lyons Creek is that a lot of the planning work and project development was done by non-farmers and that includes Iowa Soybean in that conversation as well. You know, although our members are farmers, our staff are not and we can develop a plan and we did help develop a plan but there was very little farmer input. I think that's the biggest thing that I would change is, from the beginning of the project is develop a relationship with farmers in the watershed to get their input, get their feedback, have their buy-in as we went through that watershed planning process.*

*I think if we could have them tell us what practices or approaches they feel would work in the watershed, I think that would go a long way to getting buy-in when we ask people*

*to do things in the watershed. You know, that was not done when we were developing the watershed plan and the various funding applications that have been developed over the years is, we feel like we have a pretty good handle on what farmers are willing to do and that might be the case but nonetheless I think having input from farmers would be, input and buy-in, would be a good addition to the project.*

**Theme KI-12: Increased focus on data, follow-up, technical assistance and practical demonstrations would improve the success of future projects.** Most respondents suggested an increased focus on providing farmers with more follow-up data, on conservation practices and testing in general and economic data tied to their land specifically, and consistent, credible advice via technical assistance and practical demonstrations. Farmers are a risk-averse population whose business is impacted at almost every level by the introduction of conservation practices. This also holds for data on practices that are harmful to the environment, such as excessive tillage. Having access to data on a practice can help the farmers determine whether or not a practice is right for their land. Respondents did not believe this was occurring as it should be and suggested doing so for future projects.

*...data is important for them. When you are asking a farmer to make a change and adopt a practice, they're also taking on the risk of that practice either working or failing, and this is their business. So, farmers really like to make a sound decision and to do that they want some data and science behind it.*

*They need access to research-based information that not only says I'm going to reduce my water quality impact by this much whether it's nitrate reduction, soil conservation, reducing phosphorus loss, they need the economics behind that and we never see that happen. We don't see that happen in any watershed project that's not exclusive to this watershed. We need economic data to support those practices so that farmers can make an informed decision about how that practice might fit into their cropping systems or not.*

*...when the funding goes away there's no economic incentive but the point is, farmers aren't looking at what the economic benefit is on their farm because they've not been taught to look at that. So we need to have that economic data.*

Respondents were not pleased with the lack of follow-up with farmers and landowners on soil and water monitoring testing results and identified that as a point of improvement for future projects. Many believe that local, especially farm-specific, data would encourage farmers buy-in to a practice for the long-term because farmers could see the results of a practice on their own land. Some respondents even suggested providing test strips and having the farmers do testing on their farms on their own as a way to engage them more directly with water quality on their land.

*...behaviorally, are they going to continue to do cover crops once the payments are gone? Or can you work with that farmer to provide science data feedback information to help them integrate that into their operation so they don't need that incentive, but they will continue doing the practice?*

*...getting farmers to do [testing] on their own, you know, whether they ever send it anywhere but at least they maybe can see what's coming out of their tile lines.*

*If we're doing any soil or water monitoring be able to follow up and show them that how it worked for their farm and why they should continue with it.*

Key informants often reported that they felt that farmers appreciated the practical knowledge they received during field days or in talking with other farmers who have implemented a practice. There was general agreement that these practical, how-to demonstrations throughout a farmer's involvement in the program should continue. Additionally, key informants suggested linking farmers to other farmers who have been involved in the program to provide some lessons learned from their peers. Involving more technically adept support so that farmers are getting data on the practices from non-conservation sources was also suggested as a way to help improve farmers' perceived credibility of the information.

*I think follow-ups should be emphasized more and maybe more technical assistance so not just getting producers signed up but then seeing them through the whole process...*

*...more involvement in the whole process of for the farmers to try out that practice. Not just getting them in the door and signed up but yeah, seeing the whole process through.*

*...have a real educated support group to provide that technical support to see them through and trying out different practices.*

*...somebody a little more versed in those things maybe could answer more questions and had more experience with what some of the producers are being asked to do would be helpful... a little more farmer-to-farmer, peer-to-peer type transaction.*

**Theme KI-13: A shift to longer-term thinking for watershed projects would yield greater engagement.** A shift toward long-term thinking, beyond the three to five-year life-span of a typical watershed project was viewed as an important consideration for future projects. Some expressed frustration that the watershed projects are funded for such short periods of time, periods they don't believe are long enough for farmers to see the results of their efforts or, in some cases, for adequate participant recruitment to occur. One respondent suggested longer-term partnerships with agronomists because they are in their position, on average, for much longer than the lifetime of a

watershed project. Others suggested spreading out the timeline of the project and focusing more on recruitment, outreach, and education in the first years before starting to fund/incentivize a practice.

*A lot of these goals and objectives we want to achieve aren't going happen in a three-year or five-year timeframe. So watersheds need it to be in it for the long haul, and we always talk about that upfront with the advisory team and the watershed folks, and we have meetings. That this is more than just a two or three or five-year effort.*

*...a longer-term strategy and sort of bringing farmers and landowners along for maybe a longer period of time where you have maybe more outreach and education prior to offering the incentives instead of vice versa, getting the funding and then pushing for farmers to try those practices within that one or two or three-year period for whatever time you actually have the funding available.*

*...I think that longer-term watershed-wide approach was always in mind but it was more difficult to implement in practice.*

*Extension field agronomist roles have been around for many, many, many years where watershed coordinator positions are usually what, three to five year projects. So we have a lot of connections with a lot of people and I think we can bring that connectivity and that expertise in local farming systems and tillage practices and water quality and nutrient management practices to the table.*

*...a lot of these watershed projects need to have a longer-term commitment so maybe, I don't know if maybe three years wasn't long enough to break through some of these farmers.*

**Theme KI-14: Incentives are necessary but may not be sufficient to drive long-term change.**

Respondents had differing opinions on the effectiveness of LCWP incentives. There were three views about incentives: 1) incentives are important motivators for those who are considering implementing a practice, 2) incentives aren't the be-all-end-all motivator and do not promote long-term adoption of practices, and 3) watershed projects need to look beyond incentives for alternative motivators that will sustain interest and adoption long-term. The first views were aligned with the notion that incentives are important motivators for those who are considering implementing a practice and their use follows a traditional approach. If some or all of the financial burden associated with a practice is removed via incentive people will be more likely to try a practice than not, which in turn may lead to long-term adoption.

*The payment, obviously, is the number one driver. I mean, at the end of the day they're businessmen needing to make a living and if they're able to make a change and mitigate*

*that change with insurance which is how I kind of look at those management activities, then that's a good thing...*

*I think they did like that there was, you know, the money was there and available and people were interested in it.*

*...I think for the farmers that were really seriously considering trying out a new practice, I think the incentives did help. I think that helped them think about taking some of the risk out of it.*

While incentives may have helped motivate some individuals to adopt a practice, some key informants did not see them as a “sure-fire” method. There were LCWP funds that didn’t get used despite being able to reallocate funds based on the demand, or lack of demand, for a practice. This suggests that there was a lack of awareness of the program, lack of interest in the practices that were promoted through LCWP, that some farmers were not motivated solely by the incentives provided through LCWP, or some combination of these. At the end of the funding period, project staff did not see farmers continuing with the practices at rates they deemed acceptable because incentives did not extend beyond the project period.

*There was a lot of funds that didn't get used and I don't know what other incentive you could offer to landowners. It just seems like a no-brainer. If there's no financial risk, then why not just try it? So yeah, on that front it was not so good.*

*We can say that cover crops were good but I don't think we had success in convincing the farmers that it's in their best interest to keep doing them. We did not have a good continuation rate once the funding fell out.*

*Can you work with that farmer to provide science data feedback information to help them integrate that into their operation so they don't need that incentive, but they will continue doing the practice [without it]?*

Project staff suggested finding alternative motivators to participation that might convince or motivate participants to stick with a practice long-term. Some respondents suggested focusing on non-monetary incentives such as education on the harm that particular practices inflict upon the local and surrounding environment and crafting messages to frame the issue of water quality as salient and personal to a farmer. One example might be current data on what comes out of a farmer’s tile, tying the pollution directly to the farmer’s land. One respondent told a story about a farmer who was motivated to change his practices because one of his children lived downstream and was affected by the runoff from his farm.

*Not all farmers are motivated through the financial side of it. It could be more of a cultural shift that needs to happen that we can show them that their neighbors are doing it and now it's okay for you to try it or some people are more motivated by the water quality thing. If we could show them that they are part of the problem and their farm tile is running very red and they're high in nitrates, then maybe that would motivate them. So I guess just finding what incentives those farmers need would be good.*

*I think the further along we got in watershed work, the clearer it became that money isn't always, even though that might be the reason that farmers initially give, well, I can't finance trying something new, I can't take the risk, that in the end it's really, the decision has to be beyond, you know, an incentive might help but the decision also has to come from somewhere else.*

*One farmer that we worked with, his daughter lives down in Des Moines and so when he realized that he was a part of the water quality problem and that his daughter is getting her drinking water from the water that is literally leaving his tile, it motivated him.*

**Theme KI-15: Reframing water quality challenges to lessen “blame” could decrease resistance to new practice adoption.** When asked about ways to improve the success of future projects, staff members identified the way they had framed the water quality issue was not always positively received by the farmers and landowners. Staff perceived that farmers took the call to action on water quality, and the focus on farming practices, as an attempt to place the blame on farmers. This may have led to negative perceptions of the program and negatively impacted recruitment efforts.

One respondent discussed a meeting in a similar watershed project wherein farmers had implemented a number of conservation practices and they were upset when they perceived that the watershed authority acted as if their efforts had amounted to naught and they needed to do more. Staff members suggested coming at the water quality problem from different perspectives. Some suggested framing water quality as a part of a larger goal of environmental stewardship while others suggested educating farmers on the problem and getting buy-in naturally. Others did not know how to create this shift but felt that a positive spin might help.

*I think they first need to be shown that there is a problem and then they need to be shown what they can do about it and not just have this huge problem looming over but that there's actually these like little tangible things that they can do.*

*Projects like this are always better when the locals see a problem and want to solve it rather than coming to them and telling them they have a problem and need to solve it.*

*...until some of this stuff is okay to talk about it and talk about it in a positive way rather than a we don't have to do this, this is a bunch of hogwash sort of way, I'm not sure that the project design is necessarily going to matter a whole lot and I don't know how to foster that level of conversation so that it becomes acceptable to talk about ways of taking care of that land instead of making that higher-dollar profit.*

*It's kind of a matter of getting over ourselves to recognize that what we're talking about with conservation stewardship doesn't have to be a death note for farming profitability, it just means some change.*

*Finding that message is how I would do things now and what I'm trying to, as a conservation planner, trying to impart to them now, but it's trying to break through the barriers of their defensiveness. They're not only more aware right now of the water quality issues and they have a better understanding, but they're really defensive now too.*

## Perspectives of Farmers (landowners and operators)

The themes from the farmer interviews fall into four predominant groupings – general views of the of the Lyons Creek watershed and water quality, perceptions of relationships between farming practices and water quality, LCWP project knowledge and views of the most valuable components, and barriers to participation in the LCWP.

### **General Views of the Lyons Creek Watershed and Water Quality**

**Theme F-1: There is limited awareness of the location of the Lyons Creek watershed.** Some farmers suggested that they and/or other farmers could not identify the watersheds associated with their farmlands. They viewed this as especially true before the Lyons Creek Watershed Project.

*There's a creek down here and I don't even know which one is Lyons Creek actually...*

*I think they showed us, you know, I wasn't real sure before the program where the Lyons Creek Watershed was, the boundaries, was I in it, was I out of it.*

*I think there was a guy that stopped in and showed me a map that some of the ground that I farmed was in that watershed...*

*[When asked if people talk in watersheds very much in farming] Not really. Most of them don't even know which ones they're in... You know our water all goes certain places but there's so much tile out there I bet half of them don't even know where it goes right now.*

The lack of identifying with watersheds may have contributed to non-participation, as some farmers noted that because their land does not directly abut the creek, they did not feel as great a need to participate.

*There are people whose land immediately backs up to and is part of the Lyons Creek and then there are farms like mine that are a half or three-quarters of a mile away. And so some of us, it's like, oh well, we're too far away for it to matter or surely this doesn't make a difference to us.*

*Well, it's hard for a person to mentally say, hey I'm part of that project when I'm six miles away. If you're not visually tied to it...*

**Theme F-2: Good water quality in the Lyons Creek Watershed is important.** Of those who could identify their watershed, farmers expressed a connection with and care for Lyons Creek, though they may not recognize any serious water quality issues.



*There's an attachment to that creek. Like I said I care about it. When I was a kid I spent more time exploring that creek than anything and that's why I really seriously think it was not as impaired as it may have been deemed but that determination was made based on something but I think it's, I just don't think we've done that bad of a job.*

*I mean we all are conscious about taking care of the soil. I mean it's our livelihood too. I mean so we want to take care of it. We want to have the water as good if not better than where we got it.*

*...I live on the farm that I farm and I've lived in Hamilton County my whole life so I'm drinking the water out of the well and go boating in the local lake or whatever and I'm as concerned about water and where I live as anybody or more so. So no matter what I'm doing, I'm trying to take care of the land and water...*

*Oh, yeah, big time. Big time about water because before I just got a drink out of the faucet and I didn't think anything of it. But when they start telling you Lyons Creek land is going clear down to the ocean, it made me think we better start doing something, act different or something because when we're gone, somebody else is going to have to do her. I want them people to drink clean water. I don't want them being like Flint, Michigan.*

**Theme F-3: Water quality is viewed by many farmers as better than in previous generations and is strongly associated with visible characteristics of the water.** Farmers' initial impressions of water quality varied from what the project initially emphasized as the primary water quality issues, and were instead strongly associated with the visible characteristics of the water. These views about water quality were largely centered on erosion-related problems, such as sediment loading. When asked about the water quality in the Lyons Creek, farmers drew on their memories of past water quality conditions for comparison with the current water quality in the area, often indicating the view that water quality is much improved from when they were young.

*It's not in too bad of shape. It's not a big enough one that there's fish and things like that and I personally haven't drawn water from it, but I don't see where it's particularly cloudy or anything like that so there's not a lot of silt being washed in.*

*I want to try and leave this better than what we had been left it and I personally think the water quality as a whole is better than it was in the '70s. I mean I'm not scientific by nature but I'm just going back to what I see and remember having been for minnow population and stuff in the creek in my youth and I personally thought, I mean I was kind of surprised when they put it as an impaired watershed because I personally thought it*

*was looking like there was more of that life than what there had been for a time period in the '70s ...*

*You have to remember when I was a kid all the ditches when the snow melted, all the snow was black in all the ditches, you know. You don't drive around and see that anymore. Very rare do you see black snow in the ditches. We continually do better all the time.*

*The only water quality they talk about 20 years ago was if Joe, your neighbor, dumped his hog tank into the creek because it was full and he needed to get rid of it.*

*I think it is far better than it was 40 or 50 years ago.*

### ***Perceptions of Relationships between Farming Practices and Water Quality***

**Theme F-4: Farmers associate specific management practices with improving water quality.** Farmers cited the shift away from plowing to new tillage practices as a major contributor to improving water quality issues often associated with erosion.

*We saw that plowing wasn't working and, let's face it, plowing was filling the ditches up with black soil and that was, that's no good.*

*I'm glad to see that a plowing board is over where they used to plow everything because that, when we got a hard rain, it did wash a lot and then you've got wind that blows your soil into the creek. So I'm glad to see that's gone. And I do think what they're practicing now is, to me, a lot better than what we ever had before.*

*I mean I know we have soil erosion but it's not like -- when I was a kid I can remember the ditches would be black because everybody plowed. I mean it would blow in the summer and it would be like dust storms but that doesn't really happen. Look at the snow right now. I mean it's melting fast enough now that if there was, I guess maybe you wouldn't see it but it used to be every time snow melted it would just turn black because there was dirt in it. You don't see that anymore.*

Farmers also emphasized conservation practices already in use on their farms, such as filter strips, as being largely beneficial to water quality.

*We've been an early adopter of a filter buffer strips for on the creeks and we basically have them along everywhere but one little section on the Lyons Creek and I farm quite a bit along that. I think that is a huge benefit to keeping the water quality.*

*I farm along a couple of drainage ditches and we put in 120-foot filter strips along everything. So we've been real proactive that way. We don't farm right up the edge of the creek anymore. We haven't for 25 years... 120-foot filter strips along every drainage ditch that we farm here and so there's no surface water just running right from the field into the drainage ditch. It has to go through the grass filters.*

Investments in and implementation of new technology, such as GPS and auto-steer, and nitrogen application strategies that are meant to reduce nutrient requirements and decrease loading in waterways were noted as positively impacting water quality as well. These included delaying nitrogen application until the spring, using a nitrogen stabilizer, or incorporating new manure application methods.

*...I've never been a fall applied anhydrous kind of guy. I've always been a spring; actually I've been mostly liquid. I want to put it on as close to the time as crop uses it as possible. So that's something that I've been, I think that I've been environmentally sensitive about.*

*N-Serve, I've used N-Serve since, oh man, I came back and started farming was it '80, yeah, and I've used N-Serve from the get go. I've been a believer in that and I think that's a big factor to have that nitrogen stabilized.*

*We have a hose and we pipe it to the fields so we do not have to run heavy tankers up and down the road or across the field and in doing so we can do some spring applied stuff that normally we have a lot of compaction with big tankers in the spring and this allowed me to not hurt myself by applying manure in the spring so it's closer to the use time so you probably have less runoff... I would say a majority of the times you have more runoff or leakage with fall applied than spring applied.*

**Theme F-5: Nitrogen use is appropriate to agricultural need and naturally constrained by economic concerns.** Farmers often explained their approach to nutrient application through an economic lens, asserting that the amount of nutrients they put on are not excessive, as over-application costs them money and provides no benefit.

*People are using a lot less nitrogen to raise corn per bushel than what we did in the past. You know, whether it's the 1960's or 70's or when it was, but it's a business and you sure don't want to spend more money raising your crop than what you need to.*

*I think most guys are pretty cognizant of, they don't want to waste anything, you know, they really don't. There's very few people that over-apply... There's no use sending it down the river. We're paying good money for it.*

*I don't know what practice you could use to reduce your fertilizer. I mean it takes 1.2 pounds of nitrogen to grow a bushel of corn and that doesn't change and you have to have, you know, the right amount of N, P, and K and your soil pH has to be right or otherwise it can't take up the nutrients. Like I said we're not using an overabundant amount of that, we don't just throw it out there because we just feel like putting nitrogen or whatever out there. You put on as much as you think you can get the benefit out of.*

**Theme F-6: Poor water quality is impacted by sources beyond crop production.** Concerns over urban contributions to poor water quality issues, including runoff from paved areas, high concentrations of pharmaceuticals, and products used for lawn care were raised by farmers.

*...I don't know that it's necessarily because we're over-applying herbicides or we're over-applying fertilizer and nitrogen, I'm just not sure... You go to the cities and they use a lot of salt and sand on the parking lots and the streets and that type of thing and that's all washing into the river.*

*One would be the water treatment facilities do not clean out hormones and all that stuff so if you have populated areas that are on birth control and what have you it ends up in the water streams and then it floats down river...*

*You take the town of Des Moines, the guy who's spreading fertilizer across his driveway and he doesn't shut it off on his concrete and it rains, where do you think that fertilizer's going? Into the sewer system. I mean, it's all over the place.*

A number of farmers suggested that water quality issues in Lyons Creek (that gave rise to the need for the Lyons Creek Watershed Project) were unrelated to agriculture.

*The Lyons Creek actually started from a pellet company located on Lyons Creek. Somehow they had something spilling out and it contaminated the creek so that drew the attention to it and from there it just snowballed. Then they went after the farmers, kept going upstream, and that's how it all got started.*

*The initial determination of it being an impaired watershed occurred quite a while back. I don't really remember the exact year but I believe there was a fish kill somewhere near where the Lyons Creek dumps in... There are a lot of other opportunities besides agriculture to have introduced something to have caused that fish kill and I don't think they've ever determined where that came from or anything...*

Within the farming community, distinctions were made between contributions to water pollution from hog producers and crop farmers and even unknown contributors that are of a natural source.

*...to me it's not all the farmer. It could be something -- it could be Mother Nature that's put stuff in the creek. One thing I don't like is what some of these big hog confinements leak and the pit gets into the creek and goes down the stream.*

*I personally think our problem with the water quality is, I don't know if you guys drive around out in the country in the fall right after harvest, there's millions and millions upon millions of gallons of hog manure being put on the soil all at once, you know, all at the same time. And liquid manure is probably the least stable of any of the nitrogen we use. You know, they're starting to put stabilizers in the manure now but I just can't help but think, say like a year like this, we had all that hog manure put on the month of November and then we had the most rain we've ever seen in December. Where did that go?*

**Theme F-7: There is skepticism about the negative impact of applied nitrogen and the attempts to mitigate the levels in waterways.** The severity of the nitrate problem was questioned by some farmers as they attributed partial culpability to natural occurrences of nitrates.

*I mean I know they've got problems with all the nitrogen that comes out in the Mississippi and there's big areas that, where there's no fish and they tell you that but how long has it been that way? Was it always that way or is it just because they make it sound like it's because we put down all this fertilizer. Maybe that's a natural thing.*

*I'd like to know what would happen if how much nitrogen is just naturally leaving our fields even if we don't apply any. You know, I think that is a big part right there. I mean, there is so much naturally occurring in organic nitrogen in the field to begin with, and even if we didn't apply I think we're still going to have nitrates in the water.*

*...combine that with the fact that it's peat, high organic soil anyway, those are factors I'm convinced that create a higher discharge rate of nitrates than the other ones.*

Their understanding of the denitrification process carried out by Des Moines Water Works – removal of nitrates for drinking water and then reintroduction of them in waste products downstream from Des Moines – was seen as not resolving the problem, but rather passing it on to other cities downstream. These perceptions illuminated some concern about the impact of nitrates, but also their view that those casting blame were not without their own culpability (i.e., the lack of “high ground”) in the complex challenge of improving water quality.

*When \_\_\_\_\_ takes out all of his nitrates out of the river the first thing he does when he's done when they dump them back in downstream from Des Moines so, you know, it's going right back into it.*

*But what I don't understand is it goes down to Des Moines, they clean it, and then dump it back in. It makes no sense. So what about the people down the river? That isn't right, you know?*

*Des Moines Waterworks is complaining about nitrates. They take them out of the river, where do they put them, right back in on the other side.*

### **LCWP Project Knowledge and Views of Most Valuable Components**

**Theme F-8: General awareness of the Lyons Creek Watershed Project was present and generally positive but farmers had little specific knowledge of project goals, funding availability, staff recognition or the extensive partner network.** Almost all of the farmers interviewed had at least heard about the Lyons Creek Watershed Project. However, when asked about their recollection of the project's goals, even farmers who implemented promoted practices and/or attended project meetings only spoke generally about water quality improvement within the Lyons Creek.

*I'm not sure, I'm not sure exactly whether they had specific written goals but I think they got some people to reduce tillage in the area and take a look at that, you know. I'm not sure.*

*No, not really. I'm guessing probably just water improvement or checking water. I guess I really don't know if they had a specific issue they were out to solve or if it was just a research, so no.*

*Just trying to clean up the water in that Lyons Creek drainage district...*

*Yeah, to clean up the water going into the creek, the nitrate levels primarily, sediment runoff.*

*Just promoting strip-tilling and stuff like that. It's still ongoing, right?*

*Just to clean the creek up, I think.*

A few farmers were under the impression that project funding had run out.

*...I guess the only place it fell short was -- and yes I turned out on the good end of it -- is that they paid very well but when they paid that well then not everybody could get in on it because they ran out of money. There were more guys that wanted to try a little bit*

*that didn't get any money to do it so then they just, most of them, just didn't do it and then the people that qualified for it that got the money we all did it, you know, and some of them still do and some of them don't.*

*I guess we started doing stalk nitrate samples in the fall, and they used to come and do that. Well, then they run out of money so we do it ourselves now.*

*Yeah. We hadn't got -- we was going to put those willow trees in one of my spots but then no money, they ran out of money... That was last year in 2015 because the money was depleted so then I couldn't do it myself.*

The Iowa Soybean Association was noted most often by farmers as one of the driving partners of the Lyons Creek Watershed Project and was identified as a critical supporter of this project.

*...I probably have greatly understated the effectiveness of the Soybean Association on this because I've got to think the Soybean Association is largely the one that got these others involved and were an advocate for the farm side and I horribly omitted that earlier but those guys have been probably the only reason I did get involved besides the personal invitation. Had it just been the Nature Conservancy, no, I would not have even gone to the meeting.*

*Iowa Soybean Association ... They worked their tails off on that project.*

*The Iowa Soybean Association really worked hard on that Lyons Creek thing.*

Most farmers could not name the project coordinator unprompted, or alternatively referenced a staff member from one of the partner organizations rather than the actual coordinator. However, more farmers remembered the project coordinator when prompted by the interviewers. When asked about the named project coordinator, many responded positively. Most farmers agreed that the project coordinator was knowledgeable and enthusiastic.

*...he did an excellent job of calling and he probably was on the edge of calling too much. But yeah, I think he did an excellent job of getting out in front of people and saying hey, here's the program, it's your decision but here's the information you can make your decision on. So I think he did a good job.*

*He is a nice guy. He want[s] to get people excited about conservation and stuff.*

*Oh, definitely. Yeah. He definitely knew what he was talking about... [Interviewer: Did he seem enthusiastic about the project?] Yeah, he was very enthusiastic.*

*Oh, yeah. He was very good, intelligent, with me.*

**Theme F-9: Project participation offers a means of inoculation against more criticism and possibly more regulation.** Project participants hoped their participation in a project like the LCWP would show that farmers are willing to take action to improve water quality issues.

*And at least having been in a project like this, you'd have at least a foot to stand on that we were making some sort of good faith effort.*

*...part of it was just the wanting to comply or be a part of it rather than worry about being told what he could and could not do in the future. I think that would be a fair answer to that question. You know, do it voluntarily so that it wasn't mandatory.*

*I mean I said, hey I think we want to participate and I think it goes a little bit to the old saying of when you're in doubt and a little hesitant about intent, it's always good to keep your friends close and people you aren't sure about even closer okay and so to keep up with it, but it does concern me particularly with the lawsuit that happened...*

**Theme F-10: Increasing practical knowledge of conservation practices or landowner/operator's knowledge of their own soil and water is valuable.** Field day demonstrations, where farmers were brought together to discuss the nuts and bolts of a practice, were a way to break down the technical barriers associated with implementing a practice.

*They took me to some other ones and showed me because I had no idea what it was. ...it was helpful just to see what it looked like because I had no idea what a bioreactor looked like.*

*I've seen where they've, them and their tenant have put on field days at their farms to show where they put these practices into effect and how they're doing and they actually have the base data to, they're taking water samples, they're down there taking water samples coming out of the tile and showing that the nitrate rates are low and that type of thing. So yeah, there were people there that I think embraced that whole heartedly yeah.*

*Yeah, the bioreactor... But they've done tours of that and then of the different strip-tillage and all that stuff so they've done a nice job of making the public aware of the things and if I was put in on the meetings I would make it all very much pro those things too...*

**Theme F-11: Having a "champion farmer" within the Lyons Creek Watershed early in the project time period lent credibility and visibility to the project.** Having a "champion farmer," in other words a farmer from the community who was involved and engaged in implementing practices who would



share their knowledge about how and why to implement practices, was seen as a facilitator of that practical knowledge. For LCWP, the “champion farmer” was a well-respected farmer in the area, who helped lend credibility to the project and its goals. The LCWP “champion farmer” also provided equipment that other farmers could use to try a practice on their farms.

*I mean [champion farmer] participated in the project but his deal was that he thought it was a good enough deal that he wanted to try and promote it so he wanted to share what he knew and try to get other people to do it and answer questions because when somebody from the government or Iowa State or whoever tells you oh this is the best way to do it, well, that's great but those guys don't necessarily, they don't necessarily farm. They can do it great but they don't have this much to do and it's all perfect.*

*On the other side of town there's a guy that's been strip-tilling for many years now and he's kind of the model we went after because we'd go to his field days and stuff. And you can see that change in your soil structure with the strip-till, no till, whatever.*

*I probably would not have tried that at all and it's not something normally, without the watershed's availability of equipment to give it a try I know I wouldn't have because you just can't go and buy a \$60,000 machine to try something...*

*When you have a well-accepted successful person in the community that's promoting something you pay attention.*

### **Barriers to Participation in the LCWP**

**Theme F-12: Change is difficult.** Several farmers noted that change is difficult and emphasized the age of farmers as a contributing factor to resistance to change.

*The average age of farming is 58 years old and they tend not to be people that want to change what they're doing so that's probably the biggest reason is that they just want to keep doing the same, you know, year after year. ... It's not easy to change a battleship and if your average age of farmer is 58 years old, you know, he's not looking to change what he does.*

*nobody wants to admit they might be doing something wrong and nobody wants to be told what they have to or should do. You deal with a lot of old farmers that have done it this way for this long and ain't changing it, you know?*

*Change is, number one, admitting you're wrong, which people don't like to do. ... A lot of times change costs money, if you have to change your operation, change your routine, you get used to doing something and it just becomes a way and change is just as hard...*

**Theme F-13: Focusing more on landowners and nuances of their relationship with operators could improve the adoption of new practices.** Several farmers noted that reaching landowners is key if you are trying to implement new, conservation-minded practices.

*If I was in charge of it, I would be talking to the landlords. That's who I'd be talking to, yeah, and, because the landlords have the ability to motivate the tenants. If the landlord is for it, the tenant is going to be for it, you know. There's landlords that have changed tenants because they maybe had a tenant that was a big operator and he really didn't have time to mess with the old stuff and some of that type of stuff and so they maybe changed tenants to a young one or a smaller one that is willing to try that type of stuff. That would be the main thing I'd do is I'd have financial incentives and I'd go for the landlords, yeah.*

*Probably include more landowners. I mean, it seemed like their main goal was to get the farmers to cooperate. I mean, there was some of the landowners participating but yeah, maybe make the landowners more aware of it.*

According to one farmer, there was at least one case where a landowner was recruited and involved in Lyons Creek Watershed project meetings. Possibly as a result of these meetings, this landowner developed an interest in strip-till and made sure that this practice was implemented on her land.

*Yeah, specifically one lady that actually she was very interested in it and wanted to see that their operator should be doing something, you know? And, yeah. I'm sure there were others there. I remember that one lady specifically, but there was probably about three other people there, you know? But yeah, she followed through, and she was one that we had her land on the strip-till in Lyons Creek doing that work in there. She was the one that wanted to be doing it, to have it be done.*

One farmer in particular noted a situation where their landowner discovered that they were being paid an incentive to implement a practice, and the landowner felt as though they should receive a cut of that money. This is especially an issue in cases where the incentive is intended to cover the added cost of implementing a new practice.

*It's a cash rent ground so I have authority to do anything I want. I just did. But on the flip side of that is that landlord found out that I was getting paid X amount of dollars for that program, wanted to know if he should have a right to have half of the price. So now which was a good thing became a bad thing. ... Okay, if it was a good thing and the NRCS paid us example \$30 because it should have cost you \$28 to plant the winter wheat and kill it off. Well, your landlord just sees it as you're getting \$30 and if you give*

*him half, you get \$15, it cost you \$28, now it's a detriment to me. ... [The landlord will] either politely ask you, did you get \$30 for that per acre or they'll just raise your rent the next year and you may not even know that was his reason. ... So if you did it on your own, of course, he wouldn't ask you for it because he wasn't at the coffee shop hearing why is [the farmer] doing that, well, because the NRCS is paying him \$30 an acre, 'Oh yeah, really?'*

Another farmer emphasized that absentee landowners may be more motivated to implement conservation practices on their lands.

*We're seeing a lot more absentee landlords, a lot of out of state landlords, a lot more women landowners that are getting, inheriting a farm from their parents and they might have, they might have grown up on the farm or maybe they didn't, you know, and they're probably going to be more interested in embracing some of this cover crops and no-till and that type of thing.*

However, encouraging landowners to require these practices by their tenant operators may not be difficult for absentee landowners. Both absentee landowners interviewed for this project expressed an interest in more conservation-minded practices, yet they were uncomfortable with the idea of telling their operator how to farm given their own inexperience.

*I do just let him farm it. I would have a strong environmental impact so, if I was doing it I'd probably think differently, but I know nothing about farming.*

*And so, at this point in time, he's got the equipment to do what he does, we're not going to ask him to mess around too much.*

Some farmers noted that money is the biggest motivator for landowners. Some saw changes in farming practices that would benefit water quality as good and fine as long as these changes did not affect the bottom line for landowners and other questioned the priority of finances over caring for the environment.

*They will be very receptive as long as it doesn't affect the amount of money they're receiving for rent. ... Yeah, money is the driving priority for all of us. We all want to have it better but it's got to be a tradeoff too with what you can do and remain competitive.*

*I don't think the landowners care either. They want the money. I don't feel like – somehow you've got to make people care.*

**Theme F-14: The conservation practices (promoted through the LCWP) were viewed as having high costs relative to benefit or as being incompatible with their current farming approach, leases or soil**

**conditions.** The annual-nature of rental contracts was perceived as standing in opposition to long-term planning and management considerations.

*There are some programs available through the government or have been where they will pay some dollar per acre payments based on some of these tillage practices but for the most part those are a five-year contract or multi-year contract and my leases are only one year at a time. That's pretty much the standard and norm here so you can't really participate in any of those...*

Furthermore, practice adoption was seen as not feasible for some operators due to the relatively small percentage of the land they farmed in the Lyons Creek Watershed.

*You can't go buy a piece of machinery for 80 acres especially when it costs 100 grand. ... I only had 80 acres up there and to change a way of practice for everything for 80 acres there's not a lot of --.*

Other farmers were resistant to some conservation practices over another, such as the incompatibility of planting cover crops with respect to their manure application needs. In addition, early emphasis on promoting cover crops through the LCWP and the challenges the early adopters faced in calibrating seeding rates and kill rates created a visible first impression of the LCWP among farmers in the area that had to be overcome as the project period progressed. These challenges seemed to have been overcome by the end of the project period.

*If you till then that doesn't...cover crops don't work because that's more of a no-till thing or a strip-till thing. It's just, you're wasting your time because then the cover crops don't get a chance to grow and get a root system and tie up the nitrogen. It just doesn't fit. I've looked into it but it just doesn't work.*

*I have done cover crop for two years. The problem with that is it doesn't really; I did that when I was trying the strip-till. That doesn't really fit in well at all with this other method we're using because by the time we get the fall tillage done there isn't really enough time for that cover crop to get established and be doing any good. It's pretty much I think just wasting the money on that, at that point.*

*And in the Lyons Creek Watershed, I guess, the biggest landowner, the biggest farmers of that watershed, are huge hog producers and they're good people. I mean, they're very proactive about stuff, but they use a lot of manure and like the strip-tilling and some of that stuff just isn't practical for their operation. And so I don't think they ever participated in any of it and they own and farm maybe 30 to 40 percent of the land all in that watershed.*

With regard to bioreactors, topography was largely identified as a reason individuals were unable to implement this practice.

*... the bioreactors, there was nothing that I could, or filters or whatever they are, there was no place for me to put them and I didn't have any filters so it was not a whole lot that made sense economically.*

*These bioreactors and some of these other things that they're looking at to try to control the flow of tile water but I really don't have a way to do that. I'm not in heavily rolling ground where that would work.*

Concerns over field drainage were brought up by many farmers and were characterized as being especially unique to the area in which they live. Many farmers in the Lyons Creek Watershed perceived their soil as being thicker and higher in clay content than soil across the rest of the state. The impact of this type of soil was described as requiring more time to dry out even in seasons without excessive rainfall.

*I think it is more of challenge around here with our soils and the Des Moines lobe. We got muckier soil that stays wet and doesn't naturally drain very good. So I think this area of the state is one of the slowest adopters because there is an economic disadvantage to doing it sometimes.*

*If you got some of this ground in this Lyons Creek Project is pretty dark, sticky ground and if it had a little more sand in it you could work it a little wetter but if it's black on top, our planter, once you get in there, you're just going to start building up all the wheels and you're going to be in trouble shortly. So that's why we don't do a lot of tillage.*

*Strip-tilling is probably good depending on what kind of soil you have, and we had been told that before we started that maybe our soil was too heavy...they're not the same everywhere but they're getting pretty heavy and so in a wet year we are going to have a lot of problems.*

*I know the year that I had that yield loss on the strip-till, I know of four other people that completely gave up that actually had gone and bought the equipment and went and traded it back off and went back to their other method of farming so it wasn't just my experience that was negative toward the strip-till. There were many others in this area that had similar soil types and drainage situations as I do.*

Beyond general soil drainage concerns, many different farmers indicated that at least one exceptionally wet spring during the project period created problems for farmers who implemented strip-tillage, one of the Lyons Creek Watershed project incentivized practices. In their view, implementing strip-till seriously limits the rate at which soil dries out, which can create problems during planting season. In some cases, these wet springs caused enough frustration that some strip-till adopters gave up the practice altogether.

*Well, if you didn't go field cultivate to open up the ground the moisture would never come out so it wouldn't dry. ...in June we had to just start field cultivating fields that already had strips in them...it didn't work worth a crap.*

*...then comes along when we get too much rain in the spring. Then we're kind of in a stress period because we would get in a little bit later than they would. Some people did [strip-till], chucked it out, and aren't going to do it again ever, you know just because of that and I understand where they're going.*

*...there was a lot of guys who tried it and got hot and heavy into it three or four years ago and we had a wet spring and it didn't go so good. They sold them and back to the regular.*

*The year we decided to quit the strip-till, literally I had areas that I could not get to dry, could not get planted in those fields. Had it been not strip-tilled I would have gotten it planted because it just wouldn't dry and warm up under the cornstalks. ... it was very frustrating to go out there and go I think we can get through there today and you spend the rest of the afternoon digging 24 rows out of mud so yeah, that put the finishing touches on it for me and we could say, well that's just a rare event but it's not. I mean we have more wet springs than what we'd really like.*

Both a large-acreage farmer who practices strip-till as a result of the program and the local champion farmer, who served as a strip-till role model and lent his equipment out for others to try, acknowledged challenges of excessive rain for successful strip-till. Despite viewing the practice favorably, they admitted to not being able to implement it on all of the land that they farm, and also expressed concern that these wet springs would continue into the future.

*We still don't do 100% of our acres mainly because of drainage. I mean, our better, our rolling or drier farms we strip-till, but some of the wet farms it doesn't work. The land won't dry out. You have to have just the right year for it to work and anymore it seems like we just get too much rain.*

*[Because we had about two years that we had a problem, and yet we're little bit leery now anymore with extreme weather patterns are just off the wall it seems like for the last few years, and apparently that's going to continue for a while.*

Another project participant noted a 30 bushel per acre yield drag that he associated with drainage issues compounded by strip-till practices.

*I've tried the strip-till. As a matter of fact, I gave it a good shot through the Nature Conservancy and everything on the Lyon's Creek Watershed and quite frankly 30 bushel per acre was more than I could afford and I had a comparison, direct comparison, same date planting, same hybrids, same soil types actually just a quarter of a mile apart and there was a 30 bushel drag from what my other procedures were and a lot of that is based on some of these programs work really great if you have the right kind of soil. If they are well naturally drained, if there's some slope, if there's a little less clay content in the soil, or if they have drainage tile installed.*

Despite a handful of farmers in the area who continue to strip-till, watching others struggle was enough to scare away at least one other potential adopter.

*There were a couple of neighbors in that same territory and...both have really struggled in a wet spring and it's really scary for me. If I don't get my crop planted, I'm going to be in trouble financially. So that's just one of the reasons I'm just scared of that.*

**Theme F-15: The project incentives encouraged participation but did not outweigh perceived economic risks for many farmers.** Monetary incentives and the availability of equipment was a significant factor in participation among farmers.

*I probably wouldn't have participated if they didn't help kick in on it. I mean, if I had to dish out 27 bucks an acre to do a cover crop, I probably wouldn't have done it. If I had to spend 120 grand on a strip-till bar, I probably wouldn't have done it. It's just stuff that, if you're getting along fine without it, why spend all that money and make yourself trouble?*

*I know of one person that participated and I think it probably was largely due to the payments through NRCS for the tillage practices that were adopted.*

*I probably would not have tried that at all and it's not something normally, without the watershed's availability of equipment to give it a try I know I wouldn't have because you just can't go and buy a \$60,000 machine to try something...*

*I know of probably three people that used it for sure. I know there's a lot more but I know three people that would not have done it had that not been the case or had it not been available.*

However, there was concern by some farmers over the delayed nature of the expected benefits (i.e. soil health) of certain conservation practices that would not be realized during the project period and would require farmers to take on costs of conservation practices themselves without monetary support in the years ahead.

*The cost, I mean, if they're not going to pay for it it's not going to get done, especially now when you're trying to cut cost, you're not going to pay \$25 or \$27 an acre to put cover crops out there because you don't – they say it takes, they only pay for it for three years. They say, well, it takes seven years to really see the difference.*

*I mean we all want to go and adopt all of these practices if they really truly work comparable on yield potential or it doesn't necessarily have to be yield as long as it's economically feasible. If you can save enough money from the tillage strips and the other things to offset that loss that's fine but it was nowhere near the bushel per acre drag that I experienced and I know they say that gets better with time like five, 10 years out that it narrows up the performance on strip-till gets much better, I wouldn't be here five to 10 years out.*



## Summary

A number of positive and negative aspects of the LCWP were uncovered and shared in the interviews with the key informants and the farmers who participated in the study. They identified successful aspects of the project as well as barriers or challenges that were faced. The most successful parts of the project were the partnerships (farmers were not aware of all the partners but especially noted the Soybean Association) as well as the focus on increasing knowledge about practical knowledge of conservation practices. The barriers to implementation can be viewed in three levels: 1) barriers at the project or programmatic level, 2) barriers of circumstance at the environmental level, and 3) barriers at the individual level among the target population of landowners and operators.

*Unique Perspectives of Key Informants:* Among the key informants, the LCWP was viewed as having mixed success at best and the successes were mostly perceived to have come in the early stages of the project. Reasons identified for the limited success were: a lack of shared understanding of the project goals or criteria for success, confusion about the project identity owing to the large number of other concurrent projects and programs taking place at or near the same time, passive recruitment strategies, and limited staffing. A focus on obtaining farmer and landowner input early in the planning stages was viewed as an important consideration for future projects. The key informants also suggested that an increased focus on the provision of data, technical assistance and follow-up to the farmers would strengthen both the initial interest and ongoing participation in future projects. Additionally, key informants noted that a longer-term timeline for these projects could yield greater engagement owing to the time needed to see the benefits of many of the new practices.

*Unique Feedback from Farmers:* Farmers emphasized their recognition of the importance of healthy soil and good water quality. Many saw the current conditions as improved from earlier decades and associated water quality with the visible characteristics of the water. Specific farming practices were associated with damage to or improvement of water quality but some farmers also emphasized that poor water quality is impacted negatively by sources other than crop production. Additionally, there was a view that current amounts of nitrogen used are appropriate for need and that excess use of the fertilizers would not make economic sense. Moreover, there was also some sentiment suggesting skepticism about the negative impact of applied nitrogen on water quality (suggesting other natural sources) and suggestions that the denitrification processes conducted by some water treatment plants actually reintroduce the nitrates farther downstream (rather than reducing them through the transformation to nitrogen gas which is released into the atmosphere). Some farmers voiced concern about the increasing levels of nitrates in the water and noted that participation in projects like the LCWP may help improve water quality and provide some protection from blame and additional (unwanted) regulation.

Farmers had a general knowledge of the existence of the LCWP but had little specific knowledge of project goals, funding availability, timelines, etc. Increasing practical knowledge of farmers' own soil and water conditions was deemed a valuable component of the project.

A number of farmers noted that the practices promoted by the LCWP had what were perceived as high costs relative to benefit and notably, were not viewed as compatible with their current farming approaches, leasing requirements or (wet) soil conditions. Most farmers reported that practicing strip-till is made difficult when there is heavy rainfall in the spring. While strip-till was being promoted as a part of the Lyons Creek Watershed Project, Hamilton County experienced wet springs, which in turn led to negative experiences with the practice. Not only did this weather affect adopters of strip-till, it also appeared to have an impact on those who did not implement the practice, some of whom suggested that the knowledge of others' struggles turned them away from the practice altogether. Relatedly, several farmers also shared the belief that the soil within the region is generally more difficult to dry compared to soil in other regions. It is likely that a combination of these factors kept many farmers within the Lyons Creek Watershed from implementing strip-till or resulted in dropping out of the program after initially engaging.

*Corresponding Views:* Both the key informants and the farmers viewed the partnerships as a strength of the LCWP. The farmers noted the strong work of the Iowa Soybean Association as especially important. An important positive component of the LCWP noted by both key informants and by farmers included the use of a "champion farmer" who could share experiences and equipment to provide support and trial tests. An additional point of correspondence between the groups was the acknowledgement of the difficulty faced when asking for change in practices that are longstanding. The complex and nuanced relationship between landowners and the cash-rent operators was also viewed as an important dimension of project success (or lack thereof) for both groups. The farmers were especially sensitive to the perceived barriers in this domain. Both groups noted the challenges faced by those who are renting some or all of the land that they farm. Concerns about the implications of differing levels of support for adopting new practices and the unknown or perceived negative effect of accepting financial incentives were key considerations for many. Importantly, both groups of participants noted how difficult it is to change long-standing agricultural practices even when there are environmental and financial incentives in place to encourage that change. Both groups also articulated the need for less directed blame in the approach to addressing water quality issues. The key informants emphasized the need to reframe the approach to avoid the sense that farmers are being targeted. In the case of the farmer input, although references to reframing were not explicit, the salience of the issue and the awareness of being targeted for blame were apparent in the responses and characterizations provided by a number of the farmers.

## Conclusions and Recommendations

A number of important issues were raised by this investigation. The view that the LCWP was a limited success was shared by most participants in one way or another. There were important strengths that participants thought should be carried forward in planning for future projects as well as some challenges that should be addressed in future planning. Those issues that should be considered are listed below and focus on areas where some control can be exercised (cf. wet soil conditions or level of incentive).

### ***Existing components to continue:***

- Include partnerships with knowledgeable and trusted groups.
- Use a “champion farmer” to add value and credibility.
- Focus on increasing technical knowledge of conservation practices.

### ***Existing components to consider strengthening:***

- To the extent possible, time projects to limit overlap with other ongoing activities to reduce confusion and emphasize identity and details of project.
- Recruit more actively to ensure targeting of farmers outside of those already engaged in conservation practices and include landowners both present and absentee.
- Provide sufficient support for staffing to ensure adequate effort can be brought to all key tasks.
- Emphasize communication and administrative skills as well as agricultural knowledge in recruiting key project staff.

### ***New components to consider adding:***

- Incorporate educational information to emphasize the geography and location of the watershed, relative role of fertilizers in water quality, and clarification of details regarding denitrification processing water treatment.
- Gather input from operators and landowners during the planning stage – recognizing nuances of this relationship -- to identify potential issues and barriers that might be addressed at the outset.
- Give careful consideration to how the project is framed and communicated to reduce or eliminate instances that could be interpreted as “blaming.”

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## Appendix A. Phase 1 Key Informant Interview Guide

### Phase 1 – Stakeholders and Key Informants Interview Guide

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What was your role in the Watershed project?

[Probe] When were you hired/became involved?

[Probe] Walk me through the timeline of your involvement with the project.

What was your understanding of the overall goals of the project?

[Probe] Can you tell me about the way the project was implemented & advertised to farmers in the community? How did farmers/operators find out about the project?

[Probe] Were you involved with any outreach or activities? Do you recall any informational materials that were used for the project? If so, what...?

What was your overall assessment of the project?

[Probe] If you were asked to rate this project, how would you rate the overall success of the project?

What worked well?

[Probes] What were farmers positive about in terms of the project? What did they like about the program? What factors were helpful in getting farmers to sign-up? What did you hear that was complementary of the project?

What worked not as well?

[Probes] What were the some of the barriers to participation? What, if anything, was a negative factor affecting farmer's willingness or decision to participate in the project? What are some of the reasons for the lack of engagement or lack of follow-through with the LCWP by local farmers or operators?

Did you ever hear anything positive or negative about the project or its implementation from others involved or farmers in the community? What did you hear?

[Probe, if farmers mentioned] What, in your opinion, were some of the perceptions of landowners/operators about the program?

[Probe if negatives mentioned] Did you ever hear any complaints about the project or its implementation? Can you describe them?

If you were designing a new project for this area, would you design and implement it the same way or different? If different, in what ways?, What should be emphasized more or less?

Thinking about landowners and operators in the Lyons Creek Watershed, what do they need to address environmental challenges in the area? What information? What tools? What kind of support?

[Probe] Thinking about the Lyons Creek Watershed, in your view, are the attitudes of landowners/operators receptive to new approaches to farming?

[Probe] What specific attitudes or practices are the biggest barriers to adoption?

[Probe, if INRS brought up] Overall, what is your perception of landowner/operator awareness of the Iowa Nutrient Reduction Strategy? Are farmers in the area on board?

[INRS Probes] Is there a shared view in the area that this is an issue that needs to be addressed? Is the perception that it is a challenge that needs to be addressed, or is it overblown?

Is there anything else you'd like to share with us about the project? How it was implemented? Overall perceptions? Anything else you want to share?

Is there anyone else –staff or partners of the project? Landowners or operators? - who you think would be particularly valuable for us to interview?

That's all the questions I have for today. This information will be helpful for our evaluation, and we appreciate your time and insights on the project. Have a nice day!

## Appendix B. Phase 2 Farmer Interview Guide

### Phase 2 – Farm landowners and operators Interview Guide

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First, I'd like to learn more about what you do and how you do it...

How did you get into farming?

[Probe if absentee landowner] Have you ever done any farming?

Would you tell us a bit about your farm and what you grow or raise?

[Probe if absentee landowner] How often do you see visit land?

When was the last time you saw this land?

What do you like best about what you do?

[Probe if absentee landowner] What do you like best about being a landowner?

What is the toughest part of your work?

[Probe if absentee landowner] What is the toughest part about being a landowner?

What is your approach to farming generally? How does it change from year to year?

[Probe] Are there things you do a certain way? Certain things you don't do anymore?

[Probe if absentee landowner] How would you describe your involvement in the management of that land?

How many times per year do you talk with the farmer?

When deciding how to farm the land, who decides what methods to use?

Would you tell us how you decided to let the current tenant farm this property?

Tell me your thoughts on the biggest challenges you currently face in farming?

[Probe] How do you see \_\_\_\_\_ (challenge) being addressed in the short term?

[Probe] Do you know of any new practices/methods to address this?

[Probe if absentee landowner] How often, if ever, do you seek information about new ways to manage this land?

Where do you go to get information about programs intended to help farmers explore new approaches to farming?

[Probe, if no organizations mentioned] You didn't mention any organizations, are there any specific groups that you would talk to if you needed information on resources to implement new practices?

[Probe] Why do you go to these organizations in particular?

[Probe, if no] Are there local or state groups that you perceive as particularly helpful? Unhelpful? [PROBE FOR REASONS]

When deciding what practices you use, do you consider the environmental impacts of those practices?

[Probe] Would you say your consideration of [environmental impact] when making decisions is similar or different from other farmers in your area?

Are there any environmental impacts related to farming that keep you up at night? Locally?

What would you suggest or do to help address these issues? What strategies or tools do you think would be most effective?

[Probe] What local or governmental resources are available locally to assist farmers in meeting these challenges?

[Probe] Are there government resources available?

We've talked a bit about environmental impacts generally and water quality has certainly been in the news a good deal. I'd like to talk a bit more about issues related to water specifically. How would you describe the water quality in...

- Lyons Creek?
- Boone River?
- Des Moines River?

Water quality has certainly been in the news a good deal. Are there any issues, good or bad, that you have heard about related to the waterways in this area?

[Probe] Is this a topic of conversation locally?



[Probe] What source or sources of information do you turn to for reliable information on water quality issues in this area?

Would you say that there are certain farming practices that may contribute more to water quality problems than others?

[Probe] Different in this area? About the same?

How do water quality issues influence your farming decisions? Do they play a big part, small part?

[PROBE: How much would you say these concerns drive your decisions about how you farm?

What do you see as the best or most effective short-term solutions to improving water quality in your area?

Are there longer-term solutions you think should be adopted or supported?

[Probe] What support or assistance do you think farmers need to make these happen?

I'd like to ask about some of the practices that you've implemented.

What practices, if any, have you implemented on your farm(s) that help address local water quality concerns (e.g. growing prairie or grass strips, planting cover crops, not tilling your soil)?

[Probe, if practice is not prairie, grass strips, cover crops, or no till] Tell me more about this practice.

[Probe, if practice is not prairie, grass strips, cover crops, or no till] What made you choose this one?

[Probe, for each practice] Something you intend to repeat? Or expand on your farm? Why/why not?

Tell me a bit about your approach to using nutrients on your land.

[Probe] Are these long-standing strategies?

[Probe] Are there particular strategies that you've adopted or used over the last five years?

[Probe] What's been effective and what hasn't been effective?

[Probe] Do you find that you are using more or less fertilizer and other nutrients compared to past years?

Are there strategies for reducing nutrients that you think are less likely to be adopted than others?

[Probe] Tell me more about that

Recommendations that you think are MORE likely to be adopted?

[Probe] Tell me more about that

What experience do you have with the NRCS office and staff? Soil and Water Conservation District?

[Probe] Do you find them a valuable resource?

[Probe] For what purpose?

[Probe] Does the staff and/or the support they provide meet your needs?

[Probe] What do they do well? What, if anything, could be improved about the office, its staff, or its programs?

We've talked a good deal about water quality, now I'd like to ask about a specific project in particular. Have you heard of the Lyons Creek Watershed Project?

What do you recall about the project? Do you remember what the general purpose of the project was?

[Probe, skip if described by interviewer] In general, what was the purpose of the project?

[Probe] Do you think the project accomplished its goals?

Do you remember how you first heard about the project? How did you hear about it?

[Probe] Do you remember receiving any written information?

[Probe] Who or what organizations provided the information?

Did anyone ever talk to you in person about the project?

[Probe] Community member or someone involved in the project?

Do you remember who was in charge of the project locally? Who do you remember talking to?

[Probe] Do you remember talking to [Project Coordinator] about this project?

[Probe] Where did that take place? Here or at some other location or event?

[Probe] How many occasions did you interact with him? One, two, half-a-dozen?

[Probe] What were your impressions? Did he seem knowledgeable? Did he answer your questions? Did he seem enthusiastic?

[Probe] Did you ever attempt to reach out to contact him?

[Probe] If so, was he able to answer your questions?

[Probe] Did he get back to you in a reasonable amount of time?

Did you participate in any way with this project?

[Probe] How were you involved with the project?

[Probe] Did someone come out to collect information or take samples from your farm?

[Probe, if yes] Were the results shared with you?

[Probe, if yes] Was this something you found valuable?

[Probe, if yes] Did you feel the information was accurate?

[Probe, if yes] Did the results from the samples affect your decision-making on the farm in any way?

[Probe, if yes] Anything that surprised you in the results?

Thinking about the project more broadly, what do you think were the main strengths of the project?

Were there places where the program fell short?

[Probe - If participated in project] Was the funding provided adequate in your view?

What was your sense of the level of interest in the project among the farmers you know?

[Probe] Do you have an idea about how many area farmers participated in this project?

Was the project a topic of conversation? What do you recall about the general sentiments expressed about the project?

Did many of your neighbors participate in the Lyons Creek Watershed Project?

[Probe, if they did not participate] What do you think their reason was for not participating?

[Probe, if they participated] What do you think were the most influential factors that affected participation in this project?

What local organizations, if any, do you recall being connected to or supporting the Lyons Creek Watershed Project?

[Probe] Would you say that those organizations were strong advocates of the project?

[Probe] What do you recall was done by them to promote and implement the project?

Would you be likely or unlikely to participate in a similar project in the future?

[Probe] Tell me a little bit more about why you feel that way

If you were involved in planning a project like this in the future, what components would be most important to include? To exclude?

[Probe] What organizations would you involve? Are there any organizations that you would not involve? Why?

Thinking about the issues we've discussed today, are there any other individuals you think it would be important for us to speak with while we are visiting the community?

[PROBE: What characteristics make them important in your mind?

What else is important for us to know? Especially about the Lyons Creek program.

Anyone else we should talk to? Know who participated? Know someone who didn't participate?

Thank you for your time!

## Appendix C. Phase 2 Demographic Questionnaire

1. What is your gender?       Female       Male       Other
2. What year were you born? \_\_\_\_\_
3. Are you Hispanic or Latino/a?
- Yes
  - No
  - Don't Know/Not Sure/Prefer not to answer
4. Which one or more of the following would you say is your race? (Select all that apply)
- White
  - Black or African American
  - Asian
  - Native Hawaiian or Pacific Islander
  - American Indian or Alaska Native
  - Other  
(Specify: \_\_\_\_\_)
  - Not Sure/Prefer not to answer
5. What is the highest level of education you completed?
- High school graduate or less
  - Some college, but did not finish
  - Two-year college, associate's degree (AA/AS)
  - Four-year college, bachelor's degree (BA/BS)
  - Graduate college or professional degree
6. Which of the following best describes your situation?
- I own all the land that I farm
  - I rent all of the land that I farm
  - I own some of the land that I farm and rent some of the land that I farm
  - I own land, but I do not farm
  - Other (please specify): \_\_\_\_\_
7. In total, how many acres do you farm?
- Less than 50 acres
  - 50 to 99 acres
  - 100 to 249 acres
  - 250 to 499 acres
  - 500 to 999 acres
  - 1,000 or more acres
  - I do not farm
  - Don't know/not sure
8. In total, how many acres do you own?
- Less than 50 acres
  - 50 to 99 acres
  - 100 to 249 acres
  - 250 to 499 acres
  - 500 to 999 acres
  - 1,000 or more acres
  - I do not own land
  - Don't know/not sure