

1240-017 Little Bear Creek Watershed Improvement Project Final Report

WIRB Grant Recipient:

Poweshiek Soil and Water Conservation District (SWCD)

Reporting Period:

July 1, 2013 to July 31, 2015

Date Report Prepared: July 15, 2015

Reporting Individual: Mindy Sieck

Preparer's Signature:

SWCD Chairperson's Signature:

Summary

Little Bear Creek is a 21.79 mile Class A1 and B (WW2) warm water stream that encompasses approximately 29,202 acres in northern Poweshiek County. The lower 8.4 mile segment is listed as biologically impaired on both the IDNR 2008 303(d) list and 2010 303(d) list. Another segment of Little Bear Creek, from a tributary east of Malcom to the headwaters in Grinnell has been added to the IDNR 2014 draft 303(d) list as a bacteria impaired waterbody due to water quality monitoring completed from July 2011 to October 2012 (Appendix Figure 1). The lower 8.4 mile segment, from the mouth of the stream in Warren Township to an eastern tributary in Malcom, is also listed on the IDNR 2014 draft 303(d) list as a biological and bacteria impaired waterbody (IDNR website). The project coordinator (PC) and volunteers will continue to use the IOWATER program to complete chemical/physical and bacteria assessments at 5 sites during 10 sampling events from April through October. A one-day snapshot sampling of 9 sites throughout the watershed in August will be completed each year, and will include a chemical/physical, bacteria, biological and habitat assessment. A RASCAL assessment and landowner survey were completed through a development grant in 2011, and these assessments indicated that erosion and sediment delivery from cropland, lack of adequate buffers along the stream channel, and streambank conditions contribute significant sediment delivery to the stream, likely resulting in the impairment. An estimated 36,544 tons of sediment are delivered to the stream annually (Appendix Map 1). A total of 11,075 acres (38%) of the watershed are high priority areas or land with sediment delivery rates greater than one.

The goal of the Little Bear Creek Project is to improve water quality in 15 years by reducing annual sediment delivery throughout the entire watershed by 25% (9,136 tons or 609 tons/year) and reduce the number of priority acres by 15% (1661 acres or 111 acres/year) through installation of Best Management Practices (BMPs) within the watershed. Over our 15 year project, we would expect an additional 7% in high priority areas for a total of 23%. This goal is based on efforts to remove this waterbody from the impaired waters list by improving the aquatic environment. In order to narrow our objective, we initially focused 2 years on the headwaters of the stream in Grant and Chester townships, and then plan to progress downstream through the use of 4 management areas based on township boundaries and location of urban communities. On May 1, 2015 we started another WIRB project # 1401-001 that will focus on Malcom Township and the City of Malcom for 2 years and 9 months.

Goals

With this 2 year project in Grant and Chester townships, we planned to treat 265 acres or 13% of the 2,036 acres of priority land that delivers sediment at greater than one ton/acre annually to the stream. We planned to enhance these priority areas within the watershed by:

- 1) **Reducing annual sediment delivery** by 1,058 tons (16.3%) and associated **phosphorus delivery** by 1,375 pounds.
- 2) **Increase urban infiltration** by establishing urban rainscaping practices on 2,699 square feet to infiltrate 16,823 gallons of runoff in an one inch rain event (588,805 gallons per year based on the annual average of 35 inches/year).
- 3) **Developing an Information and Education program** aimed at creating watershed awareness for the producers and residents within Grant and Chester townships.

Through this initial project the Poweshiek Soil and Water Conservation District (SWCD) treated 190.6 acres of priority land through the implementation of 3 acres of grassed waterways, 1,675 feet of terrace, 6 water and sediment control basins, and 142 acres of cover crops for a total

estimated sediment delivery reduction of 548 tons/year and phosphorus reduction of 712.8 pounds/year (Map 1 & Appendix Photos). Three landowners also desire to install practices including a terrace, basin and 4 grassed waterways; however, they were late submitting their applications and no matching funds were available for an up to 75% cost share incentive during the remainder of this project. Therefore, these landowners will be ranked with landowners in Malcom Township during the next WIRB project.

The SWCD exceeded the urban infiltration goal by completing 5,073 sq. ft. of rainscaping practices that include 3,809 sq. ft. of permeable pavers, a 116 sq. ft. enhanced rain garden, and 1,148 sq. ft. of native landscaping. These practices will treat 33,001.25 sq. ft., reduce nitrogen loading by 5 lbs./yr., reduce total suspended solids by 1,188 lbs./yr. and treat 435,667 gallons of stormwater per year (Map 1 & Appendix Photos). Information and education goals were also exceeded by hosting additional workshops, meetings, educational programs, cleanup events, and publishing additional news releases (Table 3).

Financial Accountability

The Poweshiek County Soil and Water Conservation District (SWCD) submitted an amendment request for the Little Bear Creek Watershed Improvement Project to modify the water and sediment control basin, terrace, grade stabilization structure, no-till, rainscaping, and grassed waterway's budget goals in order to get closer to the sediment delivery reduction goals and implement practices that the priority watershed landowners were interested in at that time. The table below includes the amendment approved on June 27, 2014.

Table 1: Watershed Improvement Funds

Grant Agreement Budget Line Item	Total Funds Approved (\$)	Total Funds Approved – Amended (\$)	Total Funds Expended (\$)	Available Funds (\$)
Salary	\$30,000	\$30,000	\$30,000	\$0
Information and Education	\$2,250	\$2,250	\$825.10	\$1,424.90
Grade Stabilization Structures	\$10,500	\$3,500	\$0	\$3,500
Water and Sediment Control Basins	\$6,682	\$17,822	\$7,834.50	\$9,987.50
Grassed Waterways	\$22,395	\$12,425	\$3,142.01	\$9,282.99
Terraces	\$2,155	\$5,760	\$3,895.89	\$1,864.11
Rainscaping Practices – Permeable Pavers & Rain Garden	\$20,242	\$21,242	\$20,740.82	\$501.18
No Till	\$5,775	\$750	\$0	\$750
Cover Crops	\$0	\$6,250	\$625	\$5625
Totals	\$99,999	\$99,999	\$67,063.32	\$32,935.68
Difference				\$32,935.68

The PC hoped to get at least one grade stabilization structure implemented; however, landowners in the headwaters of the watershed were not interested in this practice. After corresponding with high priority landowners it was determined that they were most interested in terraces, water and sediment control basins, waterways and cover crops. Curt Lang and Kevin Osborn (landowners who participated in the project) were interested in completing more practices; however, they wanted to spread the expense out over multiple years and the 2 year

project was a limiting factor. The timing of the application deadline and approval dates for the Environmental Quality and Incentive Program (EQIP) made it difficult to get practices implemented during the length of the project, so many of the practices were implemented through the Iowa Financial Incentive Program (IFIP). The landowner that implemented cover crops in 2014 wanted to sign up for 4 years but there was only enough IFIP funds to approve him for one year. He was very pleased with his cover crop experience and plans to use them in the future.

Table 2: Total Project Funding

Funding Source	Cash		In-Kind Contributions		Total	
	Approved Application Budget (\$)	Actual (\$)	Approved Application Budget (\$)	Actual (\$)	Approved Application Budget (\$)	Actual (\$)
WIRB	\$99,999	\$67,063.32			\$99,999	\$67,063.32
SWCD	\$10,000	\$10,284.05	\$0	\$2,475	\$10,000	\$12,759.05
EQIP	\$89,240	\$9,949.01			\$89,240	\$9,949.01
Center for Prairie Studies	\$750	\$0	\$1,950	\$2,036.75	\$2,700	\$2,036.75
Imagine Grinnell	\$6,000	\$0	\$0	\$1,877.19	\$6,000	\$1,877.19
Grinnell College	\$2,000	\$154.18	\$0	\$3,659.50	\$2,000	\$3,813.68
City of Grinnell			\$0	\$2,220.34	\$0	\$2,220.34
REAP	\$0	\$7,986.65			\$0	\$7,986.65
IFIP	\$0	\$29,672.80			\$0	\$29,672.80
Recipient - Landowner	\$48,480	\$95,594.36			\$48,480	\$95,594.36
Totals					\$258,419	\$232,973.15

Watershed Improvement Fund contribution: Approved application budget: 39%
Actual: 29%

The SWCD provided an additional in-kind contribution to the project by providing salary for a part-time PC to work on tasks, January-June 2015, before the start of the project. The SWCD also provided an additional cash contribution at the end of the project so the PC could attend training and finish project related tasks.

Grinnell College and the Center for Prairie Studies did not provide as much of a cash contribution to the project as planned because the location where they wanted to implement a demonstration rain garden was unsuitable due to a high water table. However, Grinnell College provided more of an in-kind contribution than planned by providing a community service work study position to work with the NRCS on the project. This student helped organize creek cleanup events, storm drain labeling events, organized a lowwater student group that completed water monitoring on the creek, organized a watershed awareness display with educational handouts and display books at the Grinnell Drake Community Library and the Grinnell College Library, presented to 25 boy scouts on watershed awareness, distributed 100 watershed awareness door hangers, and applied for and received a \$1000 Community Engagement Award through the college that helped pay for educational materials, orange safety vests and trash

grabbers for creek cleanup events, a portable closet for student volunteer waders and IOWATER training costs, and a food budget for educational events.

Imagine Grinnell did not provide as much of a cash contribution to the project as planned because a soils investigation revealed a high water table and high clay percentage at Summer Street Park where they were completing improvements. Imagine Grinnell provided in-kind contributions to the project instead by helping advertise and host educational events. They also provided an in-kind contribution of \$32,680 towards improvements at Summer Street Park, which is the headwaters of the Little Bear Creek Watershed. These improvements included hosting 4 building events at the park to install a natural playscape, and they had a total of 160 volunteers that worked for an average of 4 hours each to build a playhouse with sand pits, pergola over a sandpit, bridge over a crawling tunnel, dry riverbed water feature, living tunnels, climbing wall, embankment slide, entrance arbors, a monarch waystation (pollinator garden) and a giving garden. This will bring more people to the park to see our watershed educational sign and creek sign (Appendix Figure 2 & 3).

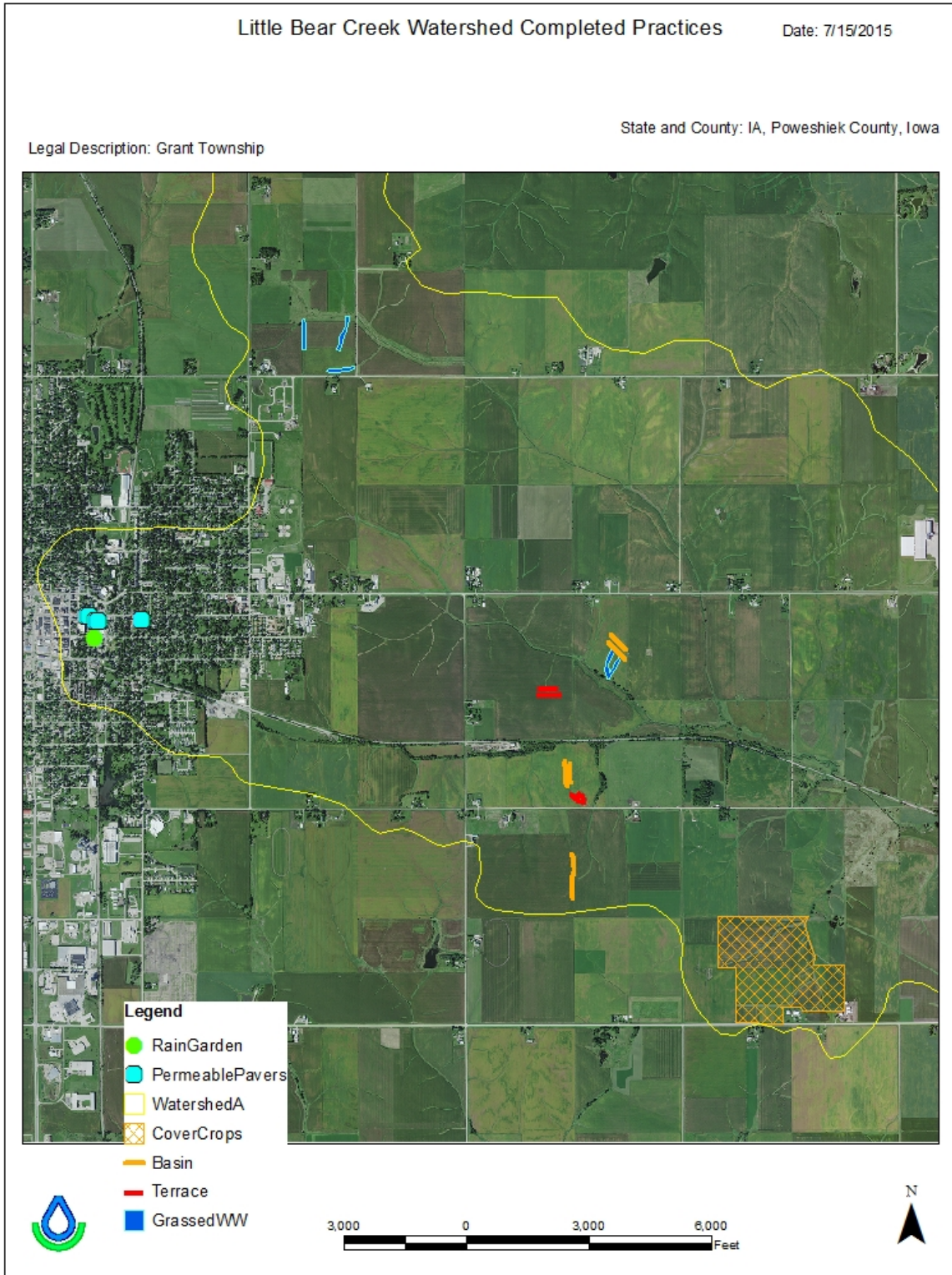
City of Grinnell provided in-kind contributions and cash contributions to the project. They installed two permeable paver demonstration projects at the Grinnell Drake Community Library, provided trash removal for creek cleanups, supplies for labeling 300 storm drains (“no dumping, drains to creek”), supplies and volunteered time to post educational signs, and an enhanced rain garden drain (bump-out) to the city storm sewer line. During the 2017 construction season they will also invest \$100,000 to build a sanitary sewer relief main at Summer Street Park to eliminate the sanitary sewer backups and by passing that has been occurring at this location, which will greatly reduce the chances of waste water entering the creek.

The additional in-kind contributions and a higher percentage of landowner contributions (mainly funds raised by the Grinnell Library for the permeable paver practices) reduced the overall percentage of WIRB contributions from what was originally planned.

Table 3: Practices and Activities

Practice	Unit	Approved Application Goal	Amended Application Goal	Total Accomplished	Percent Completion of Amended
Grassed Waterways	Ac.	15	8.6	3	35
Grade Stabilization Structure	No.	3	1	0	0
No-Till Farming	Ac.	154	150	0	0
Terraces	Ft.	2,076	5,343	1,675	31
Water & Sediment Control Basins	No.	11	24	6	25
Rainscaping Practices	Sq. Ft.	2,699	2,832	5,073	179
New Cover Crops Incentive	Ac	0	500	142	28
Activities	Unit	Approved Application Goal	Amended Application Goal	Total Accomplished	Percent Completion of Amended
High Priority Landowner Contacts	No.	22 (Rural)	22 (Rural)	22 – rural 27 - urban	100 223 (with urban)
Newsletter and/or Newspaper Article Quarterly	No.	8	8	28	350
Workshops	No.	2	2	3	150
Education Program with CPS/Grinnell College	No.	1	1	3	300
Meeting with Advisory Board and/or SWCD Commissioners	No.	8	8	17	213
Creek Cleanups	No.	2	2	3	150
Volunteer Work Days	Hr.	100	100	104	104
Coordinate/Host Educational Programs	Hr.	50	50	27.25	55

The SWCD did not get as many rural practices implemented as planned, so they did not meet the sediment delivery reduction goal. However, if the 3 additional landowners implement the terrace, basin and 4 grassed waterways, then the SWCD will be very close to the goal for the headwaters. Also through information and education efforts by the SWCD and their partners, there are 9 rural landowners in Malcom Township that have contacted the office about BMPs and 4 that have submitted applications. Two Malcom landowners have also contacted the office about urban rainscaping practices within the City of Malcom. An additional landowner just outside the watershed in Grinnell was approved for a permeable paver project through the REAP program, and two other landowners within the watershed in Grinnell have recently contacted the PC about a permeable paver sidewalk in front of the St. Paul's Episcopal Church and another permeable paver driveway. The demonstration practices and educational signs implemented through this project are leading to more interest from other community members, and has been a success for this project.



Map 1: Little Bear Creek Watershed Practices Implemented in Grant Township

APPENDIX

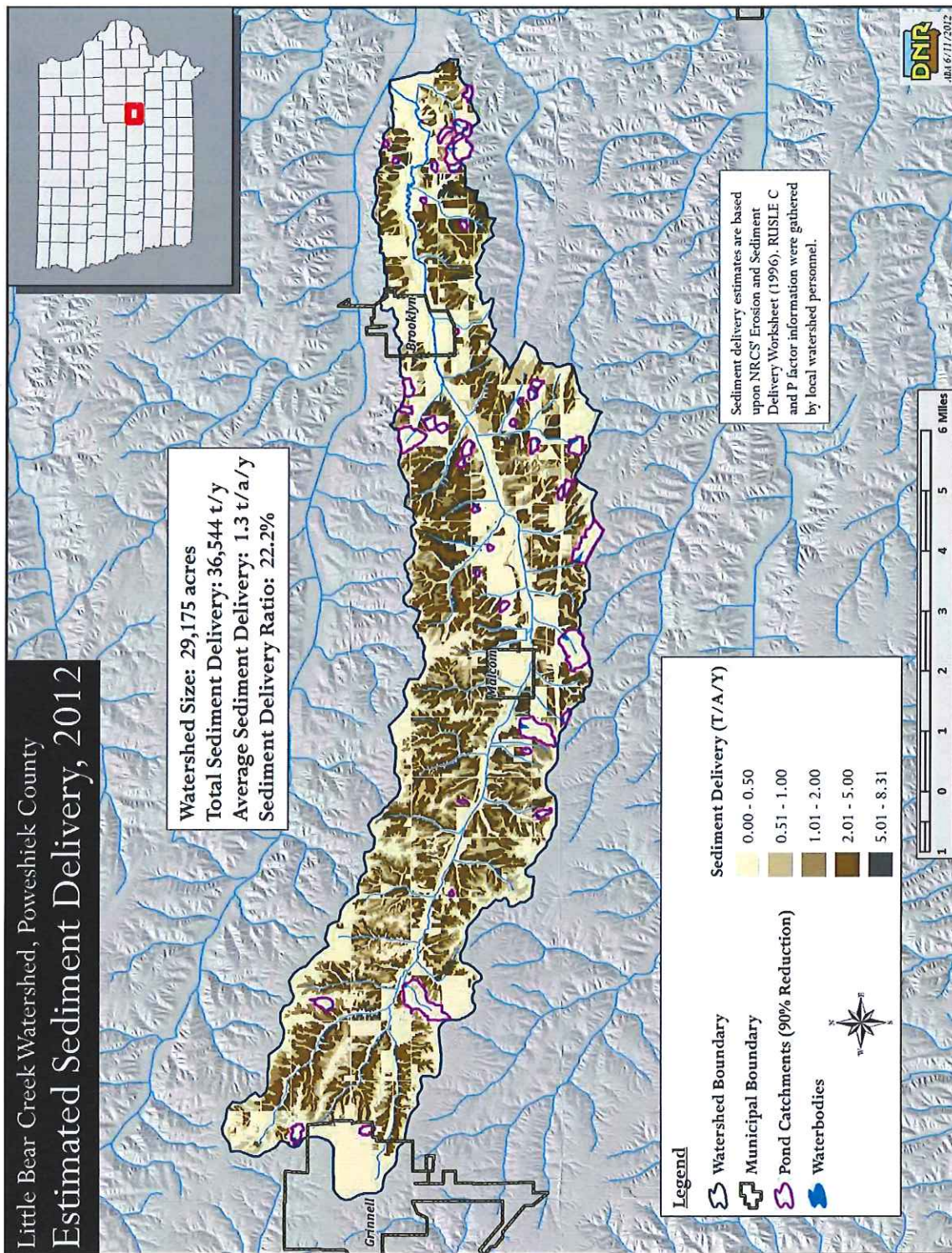
Map 1 – RASCAL Map of 2012 Estimated Sediment Delivery.....II

Pictures of Implemented BMPs.....III-VI

Figure 1 – IDNR Monitoring Data for Little Bear Creek.....VII

Figure 2 – Educational Sign at Summer Street Park.....VIII

Figure 3 – Picture of Creek Sign in Brooklyn on V18 Rd.....IX



Map 1. RASCAL Map of 2012 Estimated Sediment Delivery

Pictures of Implemented Practices:



Caroldon's Before and After 875 feet of Terrace



Daryl Morrison's Cover Crops 72 acres in 2014 – Radishes



Kevin Osborn's Before and After 1.2 acres of Grassed Waterway and 2 Basins



Virgil McDonough's Before Erosion Picture and After 1.8 acres of grassed waterways



Curtis Lang's Before and After 800 feet of terrace



Caroldon's Before and After (North 2 Basins) and During Construction 2 South Basins



Drake Community Library Before Permeable Pavers on North Side of Library



Drake Community Library After 579 sq. ft. of Permeable Pavers added on North Side of Library



Jean Reavis and Vicki Bentley-Conditt's Before & After Joint Permeable Paver Driveway (1875 sq. ft.)



Drake Community Library Before Permeable Pavers on the South Side of Library



Drake Community Library After 1355 sq. ft. of Permeable Pavers on the South Side of Library



Hammouda LC Before and After 116 sq. ft. of Enhanced Rain Garden at the Relish Restaurant



Grinnell College Before and After 1100 sq. ft. Native Landscaping - Buffalo & Blue Grama Mix



Summer Street Park 48 sq. ft. Native Landscaping (Pollinator Garden)

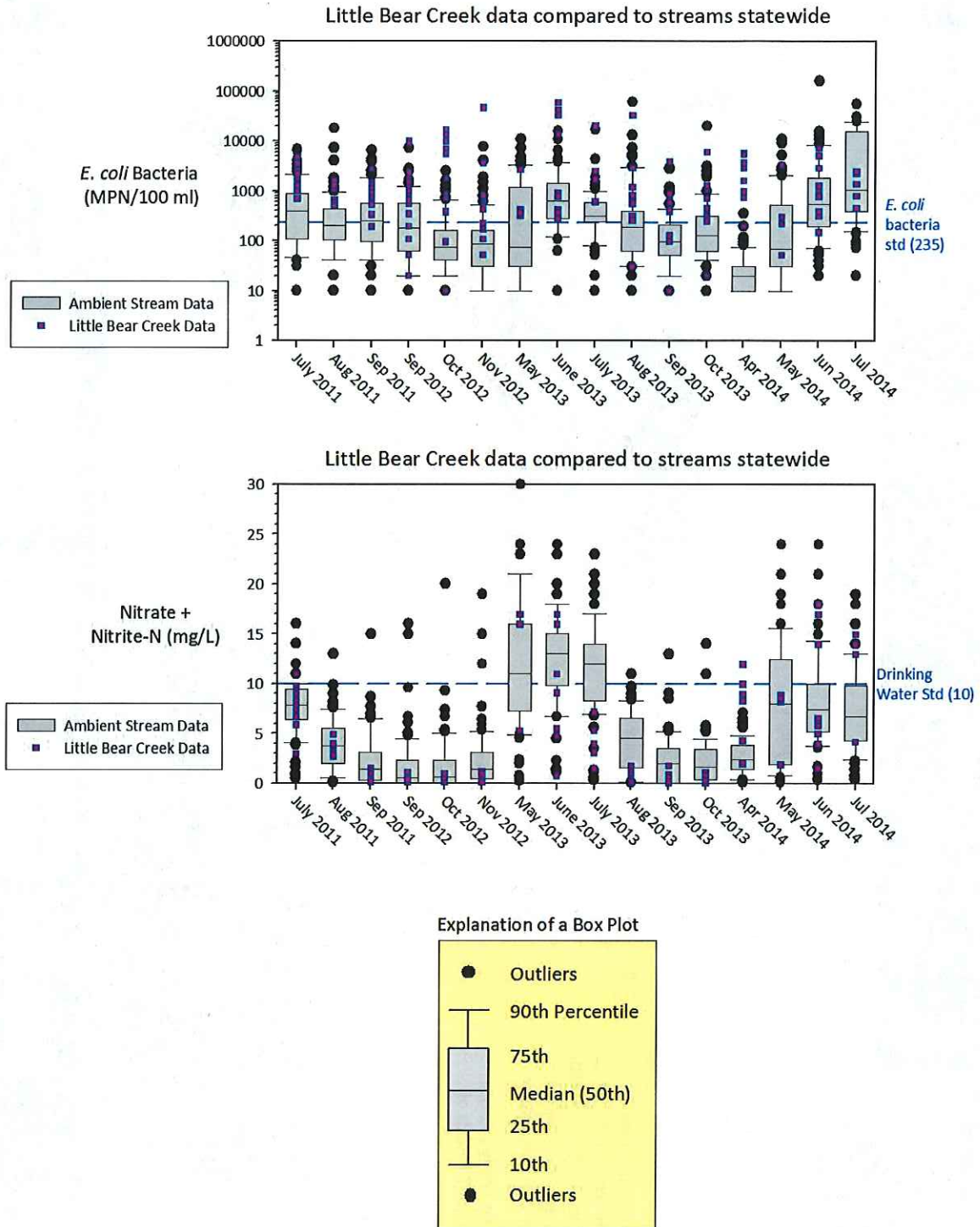


Figure 1. IDNR Monitoring Data for Little Bear Creek



Figure 2. Educational Sign Located at Summer Street Park in Grinnell



Figure 3. Picture of Creek Sign in Brooklyn on V18 Rd. - 13 Signs Installed at 7 Locations in the Watershed

