

Indian Creek Watershed Management Plan

Annual Plan Review

Year 1 (July 2015 – June 2016) of Phase I
(fiscal year 2016 to fiscal year 2021)

Completed by: ECICOG & ICWMA Board of Directors
Date of Completion: September 30, 2016



Background

The Indian Creek Watershed Management Authority (ICWMA) was formed in August 2012 to bring jurisdictions together to plan for improvements on a watershed level. Funds were made available in 2013 by the Iowa Economic Development Authority to complete watershed management plans to address flood risk mitigation and water quality. To that end, the ICWMA embraced a cooperative, multi-jurisdictional planning approach facilitated by the East Central Iowa Council of Governments (ECICOG) in partnership with several local, state, and federal agencies for plan development. The resulting Indian Creek Watershed Management Plan (ICWM Plan) identifies strategies and recommendations for stormwater management and water quality protection, including specific implementation activities and milestones. The Plan was completed and presented to the public in June 2015 and adopted by all six of the ICWMA members at policy maker meetings during July and August of 2015.

Plan Evaluation

In order to effectively advance the strategies and activities identified in the ICWM Plan, a routine evaluation to measure the progress towards plan implementation must be completed to meet the long-term goal of a healthy watershed. As outlined in Chapter 11 of the ICWM Plan document, the evaluation will be achieved through annual plan reviews and plan updates that occur every five years. The reviews and updates are an important component of the adaptive management approach.

Adaptive management is a type of natural resource management in which decisions are made as part of an ongoing science-based process. Adaptive management involves testing, monitoring, and evaluating applied strategies, and incorporating new knowledge into management approaches that are based on scientific findings and the needs of society. Results are used to modify management policy, strategies, and practices. (USGS)

The adaptive management approach recognizes the limitations of current knowledge regarding future situations, and the inevitability of change. The ICWM Plan provides a big-picture context for specific actions based on best available data, and will need to be adjusted as better information or new conditions arise. This document represents the Year 1 ICWM Plan Review of the first 5-year Plan Phase that spans fiscal year 2016 to fiscal year 2021. In fiscal year 2021, a full plan update will be conducted.

Annual Plan Review

The purpose of the annual plan review is to identify and discuss implementation challenges to determine if there is a need for plan amendments. The annual reviews are a reminder that the ICWM Plan is adaptable, dynamic and flexible.

The process to complete the Year 1 ICWM Plan Review included an information request of the ICWMA Board members and key Technical Team members involved in monitoring or implementation activities. The information collected includes:

- Education Activities – Reporting of education and outreach efforts over the past 12 months
- Alignment of policies– Status of adopting model ordinances during the year
- Watershed Improvement Projects – Track implementation of projects and locations, provide watershed-wide summary with a map
- Watershed Conditions Assessment – Update and summarize watershed analysis and monitoring project data

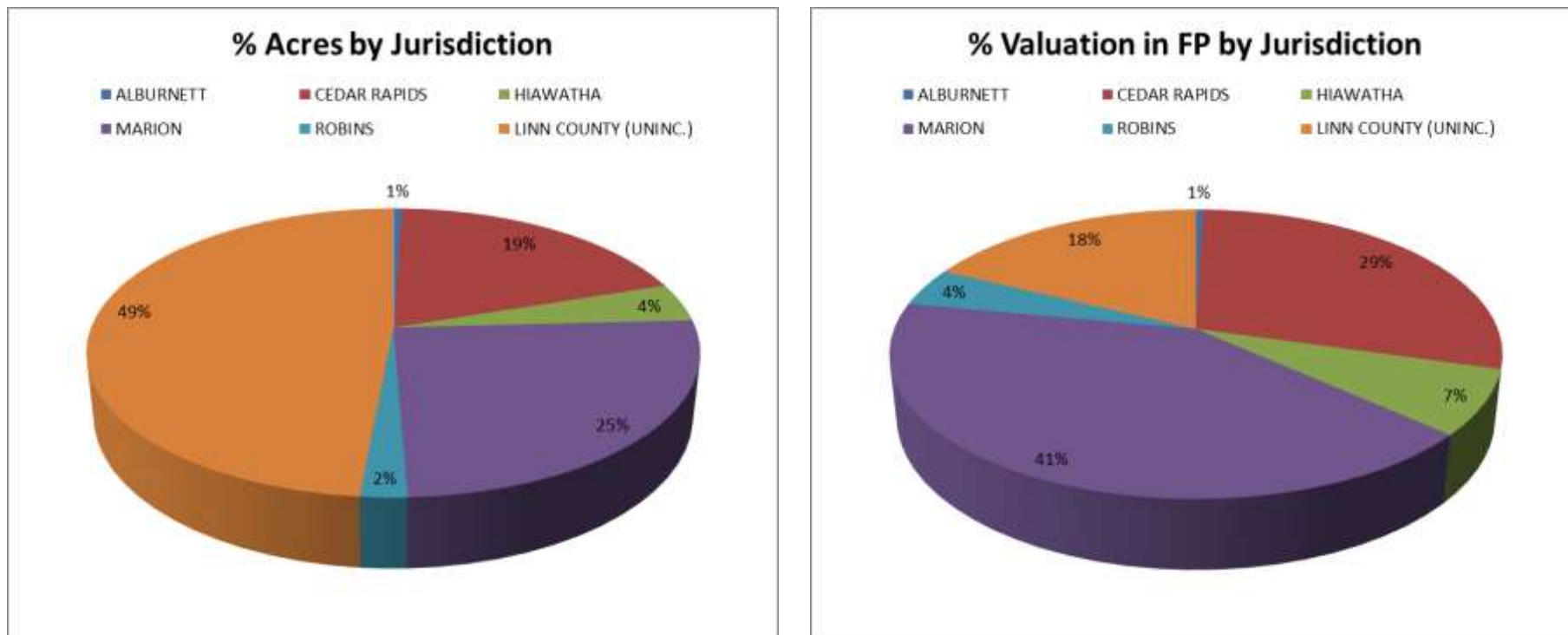
The Year 1 ICWM Plan Review first examines the organizational management for the ICWMA including a review of the member contribution formula and the fiscal year 2016 work plan tasks and results. Next, individual ICWMA member actions, improvements, activities and results related to the improvement of the

Indian Creek watershed in fiscal year 2016 are summarized. The annual plan review concludes with some additions to the existing watershed assessment and recommendations for the coming year.

Organizational Management Review

The ICWMA Board of Directors recognized the need to transition from grant funded planning activities to a locally supported organization to advance the Plan. ECICOG proposed a budget of \$50,000 to fund an organizational management services work plan for fiscal year 2016. To support this work, the ICWMA Board collectively determined a formula to calculate member contributions based on two measures of “stake” in the watershed. The first is based on total area of each jurisdiction in the watershed making up forty percent of the contribution and the second is based on the assessed valuation of property within the FEMA 100-year flood hazard area making up the remaining sixty percent of the contribution. The graphs below depict the contribution breakdown.

Figure 1. Factors Used to Calculate Contributions



Fiscal Year 2016 Organizational Management Work Plan Review

Table 1 below summarizes the fiscal year 2016 work plan for organizational management services provided by ECICOG. The first two columns outline the expected tasks and outcomes and the third column details the actual results.

Table 1. Organizational Management Work Plan Review for FY 2016

Tasks & Associated Actions		Anticipated Outcomes	Actual Results
a. ICWMA Board of Directors			
	Quarterly Board meeting	Meeting second Wednesday in Aug, Nov, Feb, and May	ICWMA Board meetings held Aug. 12, 2015; Nov. 4, 2015; Jan. 12, 2016; Apr. 22, 2016
	Establish Sub-Committees Education & Outreach Agriculture Related Monitoring & Analysis Policy & Ordinance Review Infrastructure	Recruit participants and organize initial meetings for at least 3 sub-committees to develop their individual work plans	Met with Linn SWCD, NRCS, and IDALS staff to brainstorm about establishing the Ag related subcommittee
	Represent the ICWMA as requested	Give informational presentations and/or continue communication with other WMAs in Iowa	Presentations at Linn Mar FFA class, Iowa APA Conference, Farm Bureau Annual Luncheon, Linn Mar Natural Resources class, Iowa WMA meeting, Iowa Water Conference, Cedar River Coalition meeting
b. Education & Outreach			
	Organize workshops identified in the ICWM Plan & aligned with the Education & Outreach Sub-Committee work plan	Host at least 4 workshops identified in the ICWM Plan	Marion partnered with ISWEP to host cluster trainings over two all day events related to concrete wash-out, SWPPP, and info for realtors/developers
	Coordinate with Coe College to promote their 3 rd Grade curricular materials based on Indian Creek	Promote the use of the materials in schools	The curriculum was completed
	Coordinate with Linn-Mar High School FFA group on their video documentary of ag conservation practices project	Assist with connections for video production and content	Provided information to FFA teacher and presented at Linn Mar Natural Resources class. Three students qualified for the State Enviro-thon Contest
	Organize events that connect people to the creeks such as clean-ups or storm drain labelling as identified in the ICWM Plan	Organize at least one event identified in the ICWM Plan. Examples include One Day in May, Art on the Drains, and rain barrel workshops	Assisted in promoting events such as Ag Day in the Park, Farm Bureau Field Day, etc.

Table 1 Continued

Tasks & Associated Actions	Anticipated Outcomes	Actual Results
c. Grant Writing		
Complete grant applications as opportunities arise	Complete at least two grant applications on behalf of the ICWMA and ICWMA Members	Assisted with 4 grant applications: <ul style="list-style-type: none"> - EPA Environmental Education for CR - WQI Urban Practices for CR - Iowa Initiative for Sustainable Communities for Linn County - VISTA AmeriCorps for ECICOG
Provide relevant information for others completing grant applications	Provide information as requested	Responded to information requests from: <ul style="list-style-type: none"> - Coe College - FFA at Linn Mar - Trees Forever - GeoTREE Center - Prairiewoods - City of Iowa City
d. Annual Review of the ICWM Plan		
Coordinate with Monitoring & Analysis Sub-Committee and ICWMA Members to collect and compile watershed assessment	Monitoring plan in place and data collected for the report	Requested monitoring report from Dr. St. Clair at Coe College
Establish a process to track BMPs and create a summary map for the annual report	BMP tracking method developed and summary map completed	Worked with Linn SWCD office to get a practices map
Draft the annual State of Indian Creek Watershed report	Report completed and distributed to ICWMA Members and findings communicated to watershed stakeholders and the public	Draft ready for ICWMA Board review

Evaluation of FY16 Organizational Management

While there were many positive results from the fiscal year 2016 work plan, several of the tasks proved to be more time consuming than expected. ECICOG reported that forming sub-committees to advance Plan implementation and many of the education and outreach activities were tasks beyond existing staff capacity. The ICWMA Board requested a scaled back organizational management work plan for fiscal year 2017 and is considering the possibility of hiring a dedicated Watershed Coordinator in the future. The ICWMA Board is also pursuing the establishment of a detailed strategic plan for the remainder of the ICWM Plan’s Phase I – Fiscal Year 2016 to Fiscal Year 2021.

Public Outreach and Education Activities

ICWMA members undertook the following public outreach and education projects and/or activities leading up to and including fiscal year 2016.

Table 2. Public Outreach and Education Activities through FY 2016

Date	Event	Topic	Presenter/ICWMA Member
April 2015	ECOFest in Cedar Rapids	Public outreach about stormwater and watershed management	Cedar Rapids Public Works Staff
June 2015	Linn County Chapter of Pheasants Forever	Presentation about Indian Creek watershed and the planning process	ECICOG – Jennifer Fencil
June 2015	McKinley Middle School Sixth Grade Presentations	Presentation about floodplains and watersheds highlighting the importance of water quality and stormwater management	Cedar Rapids Public Works Staff
July 2015	School Truck Visit - Five Seasons Learning Center	Environmental Awareness	Cedar Rapids Public Works Staff
July 2015	WPCF tour - IAWEA Conference	Wastewater treatment, storm sewers vs. sanitary sewers, proper disposal of cooking grease, and related topics	Cedar Rapids - John Ernst
July 2015	Nutrient Reduction Strategy Summer Tour	Linn SWCD and Linn County Farm Bureau host tour of production strategies to limit nutrient loss, reduce erosions rates, and improve soil quality for 50 people	Linn SWCD – Jon Gallagher
August 2015	Growing Sustainable Communities Conference (Dubuque)	Integration of flood control system with greenway and natural habitats; Comprehensive approach to disaster resiliency	Cedar Rapids - Sandy Pumphrey, Kasey Hutchinson
September 2015	Linn Mar High School Natural Resources/Ag class	Presentation about the Indian Creek watershed and the ICWM Plan	ECICOG – Jennifer Fencil
September 2015	Prairie Hill Elementary	Presentation to 3rd graders on water quality	Cedar Rapids Water Utility Staff
October 2015	Iowa Chapter of the American Planners Association conference in Sioux City	Session presentation about the Indian Creek WMA and the planning process	ECICOG – Jennifer Fencil

Table 2 Continued

Date	Event/Activity	Topic	Presenter/ICWMA Member
October 2015	WPCF tour- Iowa State University, Center for Crops Utilization Research	Wastewater treatment, storm sewers vs. sanitary sewers, anaerobic treatment facility, use of bio-gas, industrial trends and needs for wastewater treatment	Cedar Rapids - Mike Kuntz, Roy Hesemann
November 2015	School Truck Visit- Johnson Elementary	Environmental Awareness	Cedar Rapids Public Works Staff
November 2015	Iowa Certified Inspection and Maintenance Program for Stormwater Practices at Hiawatha City Hall	Workshop for stormwater practice inspectors	Marion – Steve Cooper
December 2015	Iowa Farm Bureau’s Annual Luncheon in Des Moines	Panel session about the Indian Creek WMA and the planning process	ECICOG – Jennifer Fencil
December 2015	Construction site stormwater pollution prevention lunch & learn at Lowe Park in Marion	Workshop for contractors to reduce construction site erosion	Marion – Steve Cooper
December 2015	Iowa Certified Construction Site Pollution Prevention Inspector at Marion Thomas Park	Workshop for construction site inspectors	Marion – Steve Cooper
December 2015	Iowa Stormwater Management Manual review at Cedar Rapids City Services Center	Workshop for stormwater professionals	Marion – Steve Cooper
December 2015	School Truck Visit- Cedar Valley Montessori School	Environmental Awareness	Cedar Rapids Public Works Staff
February 2016	Meet with Linn Mar High School Natural Resources/Ag class	Help the students prepare for the State Environ-thon Debate Contest focusing on watershed issues	ECICOG – Jennifer Fencil
February 2016	Statewide WMA Coordinators meeting in Des Moines	Represent the Indian Creek WMA	ECICOG – Jennifer Fencil
March 2016	Iowa Water Conference in Ames	Represent the Indian Creek WMA	ECICOG – Jennifer Fencil

Table 2 Continued

Date	Event/Activity	Topic	Presenter/ICWMA Member
March 2016	Iowa Water, Land, and Legacy Legislative Day	Represent the City of Cedar Rapids and Indian Creek WMA	Cedar Rapids – Cara Matteson
March 2016	Social Media outreach using Facebook and Twitter	Publicize storm drain labeling opportunities and resident cost share program for installing BMPs and soil quality restoration	Cedar Rapids – Cara Matteson
March 2016	Cedar Rapids utility bill insert	Promote pollution prevention during spring cleaning for residents	Cedar Rapids – Cara Matteson
March 2016	Gazette Special Insert	Special insert publication to raise awareness about flood preparedness and flood protection	Linn County Planning & Development
April 2016	Water Pollution Control tour for Kirkwood geology class	Waste water treatment, storm water management	Cedar Rapids – Kelly Seery & John Ernst
April 2016	Cedar Rapids EcoFest	Cedar Rapids booth on stormwater BMPs and cost-share program. Metro Alternative High School rain barrels.	Cedar Rapids – various city staff
May 2016	Two-day McKinley Middle School visit to science classes	Flood control, land use changes, infiltration vs runoff, watershed management	Cedar Rapids – Rob Davis & Sandy Pumphrey
May 2016	Linn Mar High School Senior Day	Storm drain marking	Cedar Rapids – Cara Matteson
May 2016	One Day in May at Marion Independent Schools	20 high school students marked more than 300 storm drains with “No Dumping – Drains to River”	Marion – Steve Cooper
June 2016	Cedar Rapids Downtown Farmer’s Market – Resident Appreciation Day	Promoting urban BMP cost share program and general stormwater management education	Cedar Rapids – various city staff
June 2016	BBQ Roundup Family Fun Event (part of Freedom Festival)	Enviroscape watershed model	Linn County League of Women Voters

Policy or Ordinance Changes

ICWMA members undertook the following projects and/or activities in fiscal year 2016 related to policy or ordinance changes that positively impact the watershed.

Cedar Rapids

- Restructured the stormwater utility fee to further incentivize owner education, removal of existing extraneous impervious surfaces, and BMPs to be installed on private property. New ordinance effective July 1st, 2016.
- Expanded a cost share program providing up to 50% of a project cost toward installation of BMPs on private property. No individual project cost cap. Limited to available program funds, expected to be \$250,000 in FY17. Projects will be prioritized to mitigate flooding in known “problem areas” first.
- Working to adopt an ordinance to require soil quality restoration on new developments (known as the “top soil” rule).

Hiawatha

- The city has formed a stormwater committee as part of their MS4 permit requirements. The committee’s first task is to review their city ordinances.

Linn County

- Held two meeting of Stormwater Work Group to examine stormwater best management practices and construction site erosion and sediment control practices
- Entered into Memorandum of Understanding with the City of Cedar Rapids and FEMA to participate in the High Water Mark (HWM) Campaign.

Linn Soil & Water Conservation District

- Established a policy to give scoring preference to cost share requests for agriculture conservation practices located within the Indian Creek watershed.

ECICOG on behalf of ICWMA

Watershed-wide ordinance review. ECICOG intern, John Bruce, completed a watershed-wide ordinance review benchmarking ICWMA member jurisdictions against the State’s stormwater manual and model ordinances from other communities. Table 3 below provides a visual representation of six municipal post-construction stormwater control ordinances, including the four municipal members of the ICWMA (Cedar Rapids, Hiawatha, Marion and Robins) as well as two example stormwater ordinances (Cedar Falls and Coralville). The intention of the table is to identify areas where ICWMA-member ordinances might be improved. The example ordinances are held as the standard to measure the ICWMA member ordinances against. The color green denotes agreement between ordinances, while yellow indicates discrepancies.

The twenty-six criteria used to evaluate the ordinances are a slightly modified version from the Iowa Stormwater Education Partnership (ISWEP) website. ISWEP maintains a stormwater ordinance spreadsheet for member municipalities. All data for ISWEP members used in the table was downloaded from the ISWEP website and verified against each corresponding city ordinance, while data for the non-ISWEP member, Robins, was entered manually. The criteria are split into three categories: technical information for plan submission and design purposes, maintenance of BMPs, and enforcement of the ordinance.

The basis for the Technical Information criteria used is found in the ICWM Plan and on the Indian Creek Watershed Management Authority website. Stated ICWM Plan goals include encouraging use of the Iowa Stormwater Management Manual (ISWMM) by ICWMA members (Chapter 7, p. 98), as well as the soil and natural resource studies conducted as part of the ICWM Plan. Many of the differences in the ICWMA member ordinances depicted in Table 3 could be addressed by amending existing ordinances to reference the ISWMM as the standard for unified

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sizing criteria and design characteristics for BMPs. Maintenance and enforcement changes will require allocation of resources available to each city for ensuring the BMPs are both installed properly and remain in functional condition. Monetary penalties and stop work orders may provide the incentive to ensure the stormwater mitigation measures are installed and maintained properly.

Table 3. Post-Construction Stormwater Control Ordinance Review for ICWMA Member Cities

City Code Chapter	Example Ordinances		Indian Creek WMA Member Ordinances			
	Cedar Falls 2718	Coralville 159	Cedar Rapids 72	Hiawatha 162	Marion 156	Robins 157
Technical Information						
Iowa Stormwater Management Manual Referenced	Yes	Yes	No	No	Yes	No
Unified Sizing Criteria (specifically)	Yes	Yes	No	No	No	No
Size of Storm Referenced (if no USC)	USC	USC	No	PF	PF	No
Other Plan Referenced	SWMP	SWMP	SWMP	No	SWMP	SWMP
Plan Components Defined	Yes	Yes	No	No	No	No
Natural Resource Inventory	Yes	Yes	No	No	No	No
Technical Soils Assessment	Yes	Yes	No	No	No	No
Stream Buffer Easement	No	Yes	No	No	No	No
Easements, Other	No	Yes	No	No	No	No
Performance Guarantee Requirements for BMPs	Yes	Yes	No	No	No	No
Maintenance						
Inspection Required	Yes	Yes	Yes	Yes	Yes	Yes
Maintenance Required	Yes	Yes	Yes	Yes	Yes	Yes
Maintenance Form - Agreement/Covenant/Easement	Agreement	Multiple	None	Certification	None	Easement
Maintenance, Repair or Landscape Plan	Yes	Yes	No	No	No	Yes
Responsible Party for Inspection	CE	CE	CE	CE	CE	CE
Responsible Party for Maintenance	PO	PO	PO	PO	PO	PO
City Reserves Right to Inspect	Yes	Yes	Yes	No	Yes	Yes
Recordkeeping of Same	Yes	Yes	No	Yes	Yes	No
Option to Dedicate Stormwater Practices to City	Yes	Yes	Yes	No	Yes	Yes
Alternatives (Waivers)	Yes, ADOCE	Yes, ADOCE	No	No	Yes, ADOCE	Yes, ADOCE
Enforcement						
City Reserves Right to Correct and Assess Fee	Yes	Yes	Yes	Yes	Yes	Yes
Order to Comply	Yes	Yes	Yes	No	Yes	No
Stop Work Order	Yes	Yes	No	No	No	No
Municipal Infraction	Yes	Yes	No	No	Yes	Yes
Appeals Process	Yes	Yes	No	No	Yes	Yes
Hold on Occupancy Permit for Violations	Yes	Yes	No	No	Yes	Yes

*ADOCE - At Discretion of City Engineer

*CE - City Engineer

*DSM - Design Standards Manual (Same as MAS)

*MAS - Metro Area Standards

*PF - Peak Flow

*PO - Property Owner

*RP - Responsible Party

*SWMP - Stormwater Management Plan

*UDC - Unified Development Code

Watershed Improvement Projects (BMPs)

ICWMA members reported the following best management practices (BMP) occurring in their jurisdiction in fiscal year 2016.

Figure 2 depicts the general locations of the BMPs described below.

Cedar Rapids

- Under design, 4 pilot BMP projects within the public right-of-way (1 within the ICW) to study and monitor for larger scale implementation of BMP's across the City, for flood risk reduction and stormwater quality benefits, citywide.
- Prairiewoods stream bank stabilization project.

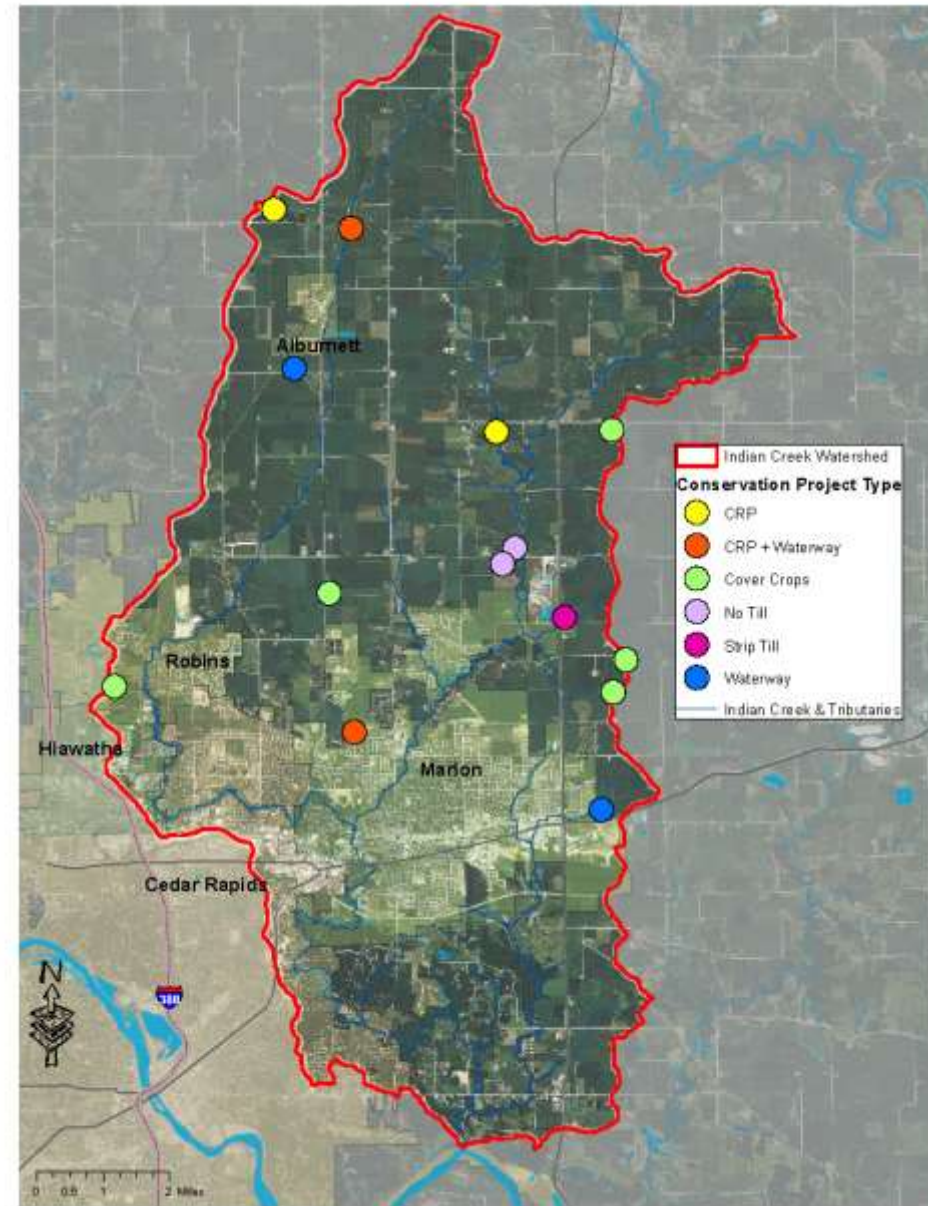
Hiawatha

- Promoting stormwater bio-swailes in commercial development parking lots.

Linn Soil & Water Conservation District

- Federal EQIP contract for 120 acres of cover crop installation each of the next 3 years.
- New enrollment of 51.1 acres into CRP by 2 land owners.
- New enrollment of 17.1 acres into CRP / Waterway by 2 land owners.
- 3.5 acres of Waterway projects by 2 land owners.
- 189.1 acres of No Till by 2 land owners.
- 72.69 acres of Strip Till by 1 land owner.
- 1,030.1 acres of Cover Crops by 6 land owners.

Figure 2. Locations of BMPs Implemented in FY 2016



Updates to Watershed Assessment

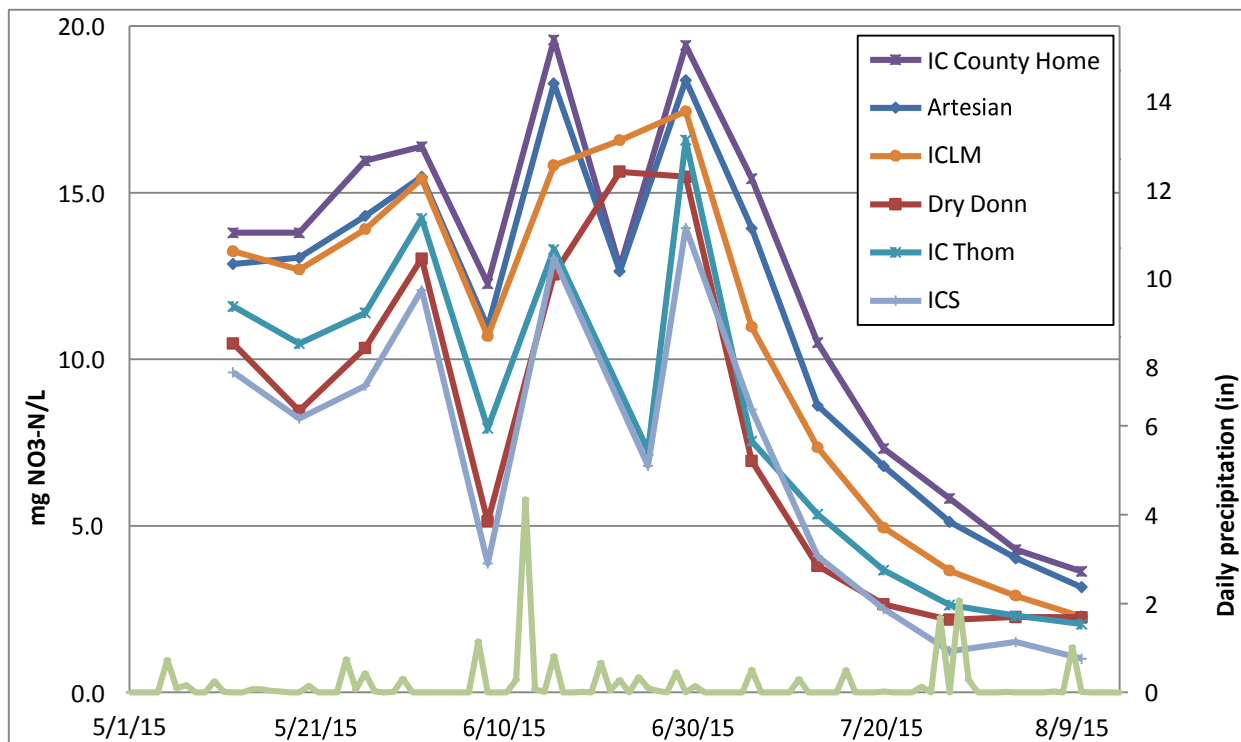
The following activities took place in fiscal year 2016 to add to the watershed assessment conducted as part of the ICWM Plan development.

Water Quality: Coe College

In a continued partnership between the City of Cedar Rapids and the Coe College Chemistry and Environmental Studies Water Quality Laboratory guided by Dr. Martin St. Clair, sampling occurred at six sites in the Indian Creek watershed from May to August 2015. Excerpts of the “Cedar River Tributary Study: Summer 2015” authored by Dr. St. Clair and four student researchers (Laura Bybee, Maddy Jensen, Ciera Rodriguez, and Christina Brown) are included here. The entire report is posted to the Indian Creek Watershed Management Authority website at www.indiancreekwatershed.weebly.org.

The Indian Creek watershed sampling results from the summer of 2015 are depicted in Figure 3 showing nitrate concentration data from throughout the watershed. The legend shows sites beginning upstream and working downstream toward the Cedar River. (Dry Creek at Donnelly Park is a tributary which joins Indian Creek between Linn Mar and Thomas Park.) Examination of this figure shows that nitrate concentrations consistently decrease moving down the watershed. The average ratio of nitrate concentrations in Indian Creek at County Home Road (IC County Home) to the nitrate concentration in Indian Creek at Mt. Vernon Road (ICS) on a given day is 2.33, with a maximum of 4.69 and a minimum of 1.36. Dilution plays a role in this decrease in nitrate concentration, including the contribution of Dry Creek. (Dry Creek has considerable groundwater inputs near where it empties into Indian Creek, which generally results in lower nitrate concentrations.) However, it is also clear that the suburban area (which includes multiple golf courses) does not make a significant addition to nitrate concentrations. This behavior is consistent with previous years’ observations. For comparison, the EPA’s suggested total nitrogen criteria is 1.965 mg N/L.

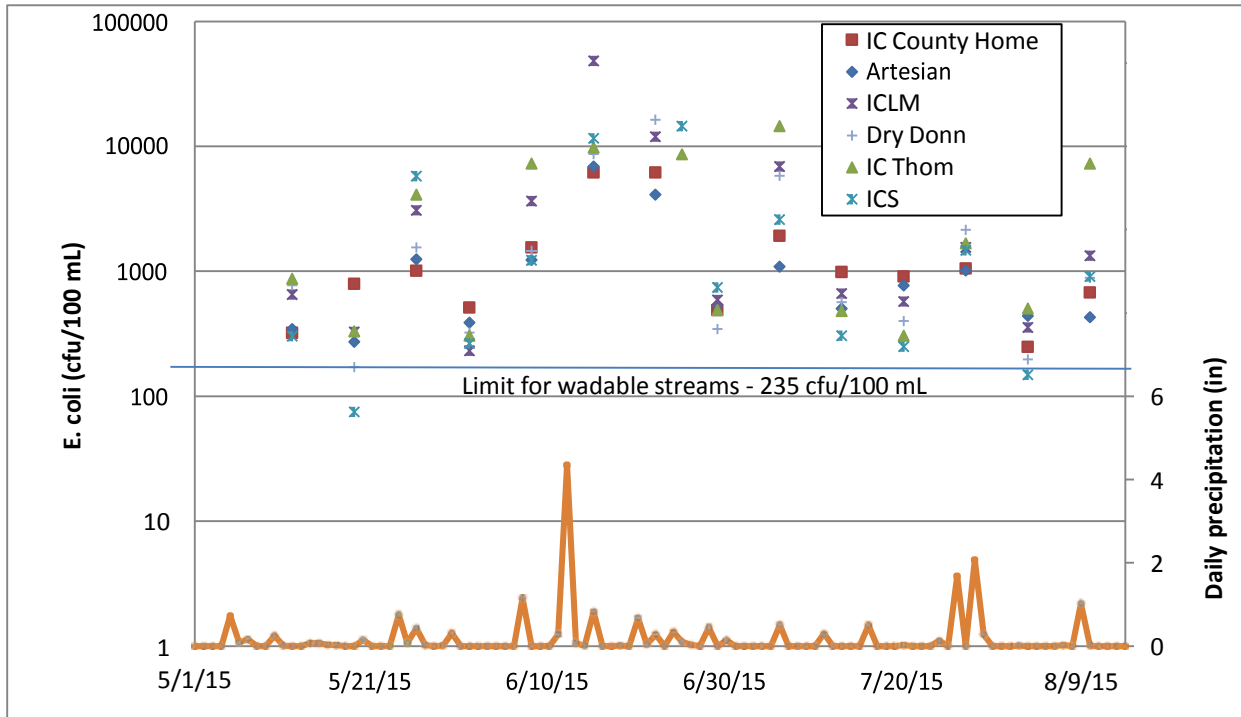
Figure 3. Nitrate-N concentrations in Indian Creek from upstream (IC County Home) to downstream (ICS). Daily precipitation⁹ is also shown.



⁹ From the Cedar Rapids Airport.

E. coli concentrations were also of concern during the Indian Creek assessment. Several parks located in the watershed offer opportunities for children to wade in Indian Creek and Dry Creek, including Donnelly Park, Willow Park, Thomas Park, Indian Creek Park, Lininger Park, Boyson Park, and the Indian Creek Nature Center; thus the children’s recreational use (A3) classification is appropriate. The state standard for *E. coli* sample maximum from 3/15 to 11/15 of each year is 235 cfu/100 mL of water.¹⁰ As seen in Figure 4, of 84 measurements made along Indian Creek and Dry Creek in 2015, 79 samples (94%) exceeded the standard. It is challenging to determine the source of these bacteria – common sources can include livestock, wild animals, pets, and poorly functioning septic systems. In addition, there is wide variability depending on precipitation, with recent intense rains resulting in high values.

Figure 4. *E. coli* concentrations in the Indian Creek watershed. The state standard for A3 waters and daily precipitation¹¹ are also shown.



¹⁰ See Iowa Administrative Code, Chapter 61, section 61.3(3). Available at <https://www.legis.iowa.gov/docs/ACO/chapter/567.61.pdf>

¹¹ From the Cedar Rapids Airport.

In Table 4, the Indian Creek sites are ranked for each sampling day. This analysis indicates that Indian Creek at County Home Road and at Thomas Park often have the highest values, while Indian Creek at Mount Vernon Road (ICS) typically has the lowest value. Both County Home and Thomas Park could have inputs from livestock (Berry’s Run enters Indian Creek above the Thomas Park sampling site and has significant pasture along the waterway), and Thomas Park could certainly have inputs from pets.

Table 4. Ranking of *E. coli* counts for the Indian Creek watershed on each sampling day.

	#1 high	#2	#3	#4	#5	#6 low
IC County Home	4	0	1	1	5	2
Dry Donn	1	1	3	5	2	1
ICS	2	1	1	2	1	6
ICLM	1	5	6	0	0	1
IC Thom	5	3	1	2	2	0
Artesian	0	3	1	3	3	3

Average parameters for other values measured in the Indian Creek watershed are shown in Table 5. Total suspended solids and turbidity increase moving down the watershed, as do chloride concentrations. Both of these observations may reflect the increasing urbanization in the lower part of the watershed, with runoff from impermeable surfaces contributing to both of these parameters.

Table 5. Average measurements for the Indian Creek watershed (median values for *E. coli*)

Site	DO	Temp	pH	Cond	Turb	TSS	DRP	Cl	NO ₃ -N	SO ₄	<i>E. coli</i>
IC County Home	8.4	17.4	7.46	473	28.5	28.6	0.16	28.2	12.2	16.6	987
Artesian	7.8	18.0	7.66	479	35.7	32.7	0.15	28.8	11.3	20.0	771
IC Linn Mar	8.2	18.3	7.73	500	29.2	29.0	0.20	28.9	10.6	20.8	1333
Dry Donnelly	9.2	16.7	7.59	519	22.1	18.5	0.21	30.7	7.9	23.9	884
IC Thomas	9.1	18.1	7.75	496	33.2	23.2	0.24	29.5	8.3	22.0	1670
ICS (Mt. Vernon Rd.)	9.3	19.3	7.78	503	45.1	43.0	0.22	32.5	6.8	20.5	908

Hydrologic Modeling: UNI GeoTREE Center

The ICWMA Board partnered with the University of Northern Iowa Geoinformatics Training, Research, Education, and Extension Center (GeoTREE Center) to complete a pilot project to demonstrate the capabilities of urban stormwater modeling. The GeoTREE Center received a grant from the Iowa Department of Agriculture and Land Stewardship State Soil Conservation Committee Research & Development program to identify several urban watersheds in the state for which a coupled GIS-urban stormwater modeling system can be applied. A sub-watershed of the Indian Creek watershed was selected for the GeoTREE Center project as outlined in Figure 5.

Figure 5. Detailed Source Area of Indian Creek Sub-watershed (near Lindale Mall)



The GeoTREE Center has developed freely available GIS-based tools and databases (ArcSLAMM) that work with the powerful and widely used urban stormwater model WinSLAMM. The use of ArcSLAMM and WinSLAMM together will provide runoff amounts, pollutant loads, and BMP modeling to measure anticipated impact in selected drainage areas.

The project will consist of digitizing detailed source areas (roofs, driveways, sidewalks, parking lots, grass, etc.) within the sub-watershed (shown in Figure 5) and then using LiDAR elevation data to delineate the smaller drainage areas. The result will be a map of the sub-watershed representing drainage areas according to how much runoff it produces as well as pollutant (sediment, P, and N) loads and concentrations. This will identify “hot spots” contributing more runoff or pollutants within the sub-watershed. BMPs can then be introduced into the model of a specific drainage area to see conditions before the BMP and results after implementation (i.e. how much improvement).

The GeoTREE Center project will add to the understanding of urban stormwater conditions within the Indian Creek watershed and may help secure grant funding to address this sub-watershed’s contribution to the overall health of the watershed.

Watershed Maps: Army Corps of Engineers – Rock Island District

The Army Corps of Engineers – Rock Island District produced several detailed maps as part of the hydrology modeling work for the ICWM Plan. These maps have been formatted to work well as poster-sized displays and are available by contacting the Stormwater Coordinator with the City of Marion.

Conclusions

The first year of the ICWM Plan implementation had successes and also identified areas for improvement.

Recommendations for moving forward include:

- Develop a strategic plan for the remainder of Phase I that identifies specific activities, responsible parties, and budget allocations. As a starting point for a strategic plan, the following tables 6.1 through 6.4 outline the progress made toward the Phase I Action Plan contained in the ICWMA Plan.
- Revisit the organizational management contribution formula and encourage full participation by all ICWMA members.
- Continue progress on local policy changes that will benefit the entire watershed.
- Consider funding an ICWMA Watershed Coordinator position (dedicated or shared) that will focus on building coalitions and advancing the Plan.
- Continue to track BMPs for the annual plan review.
- Continue the water quality monitoring partnership with Coe College.
- Incorporate the GeoTREE project results into the strategic plan development and potential grant applications for implementing conservation practices.

Indian Creek Watershed Management Plan – Action Plan Review for Phase I / Year 1 September 2016

Table 6.1 Indian Creek Watershed Action Plan – Education Strategies

Action Type	Strategy #	Implementation Strategies	Milestone(s)	Status	Accomplishments	Responsible Entity(s)	Technical Resources / Funding Options
Education		partner with ISWEP to hold workshops (with CEUs) for developers, builders, engineers, and inspectors about infiltration practices and Low Impact Development (LID)	host two workshops per year reaching at least 10 participants	Significant Progress	Marion partnered with ISWEP to host 4 different workshops	ISWEP & Marion ICWMA Board	ISWEP & Member stormwater staff
	2	develop a collaborative communication & education plan between all ICWMA members using existing materials (such as the CCB watershed PSAs)	Subcommittee established & education plan developed	Not yet		ICWMA Education Subcommittee	ICWMA Member communications & stormwater staff
	3	organize events to connect urban residents with the creek such as storm drain labeling, installing watershed signs, or festivals in parks with access to the creeks, etc.	host quarterly events	Not yet	Individual ICWMA member efforts such One Day in May, ECOFest, and Ag Day in the Park	ICWMA Education Subcommittee	ICWMA Member & local schools
	4	partner with city & county planning departments to provide trainings, tours or lunch-n-learns to Planning & Zoning Committees, city staff, and other decision makers on stormwater management practices	host quarterly events that increases the knowledge of 15 - 20 participants per year	Not yet		ICWMA Education Subcommittee	ICWMA Member
	5	communicate the importance of proper management of pet wastes to residents	Utilize existing materials in all communities	Not yet	Individual ICWMA member efforts	ICWMA Education Subcommittee	ICWMA Member communications & stormwater staff
	6	communicate with landowners about the Nutrient Reduction Strategy recommended practices & foster general understanding about the NRS through workshops, demonstration videos, and implementation of more example projects in the watershed	host one workshop per year; at least three videos created; complete at least one demo project	Not yet	Linn SWCD promoting cost share programs	Linn SWCD & ICWMA Board	EQIP; WQI

Table 6.1 continued

Action Type	Strategy #	Implementation Strategies	Milestone(s)	Status	Accomplishments	Responsible Entity(s)	Technical Resources / Funding Options
Education	7	communicate the results of water quality monitoring to educate about actual vs. perceived sources of pollution in the watershed	report results at annual watershed meeting; fact sheet posted to website	In Progress	Cedar River Tributary Study: Summer 2015 completed, results used in Annual Plan Review, and report posted to ICWMA website	Coe College & Cedar Rapids	Cedar Rapids support of Coe College
	8	develop an annual State of Indian Creek report to highlight activities, water quality, steps toward progress	annual report developed & posted to websites	Year 1 completed	Annual Plan Review Phase I / Year 1 completed and posted to ICWMA website	ICWMA Board & ECICOG	Organizational Management funds
	9	communicate the comparison of repeated flood recovery costs to proactive flood mitigation practices to policy makers and the general public	economic analysis of Mitigation Strategies Hazard Mitigation Plan update; fact sheet	Not yet		ICWMA Board	ICWMA Tech Team
	10	promote BMPs installed within the watershed as models through signage and/or inclusion in the self-guided podcast tour	BMP map; install promo signs; develop podcast tour	In Progress	BMP map created for the Annual Plan Review	ECICOG	Organization Management funds
	11	establish user friendly comment submittal system on ICWMA website to communicate issues with the trails and stream conditions	comment submittal system established and put on website	Not yet		ICWMA Board	Website developer
	12	organize Rainscaping workshops and urban BMP tours for homeowners, policy makers, or other interested stakeholders to communicate the purpose and attractiveness of BMPs	host quarterly workshops / tours	In Progress	Prairiewoods hosted ?? workshops as part of their bank stabilization project	Prairiewoods	GCRCF

Table 6.2 Indian Creek Watershed Action Plan – Policy Related Strategies

Action Type	Strategy #	Implementation Strategies	Milestone(s)	Status	Accomplishments	Responsible Entity(s)	Technical Resources / Funding Options
Policy	13	recommend that ICWMA members fully leverage all grant opportunities to the greatest extent possible	monitor funding opportunities; coordinate application development	In Progress	Assisted with 4 grant applications	ICWMA Members & ECICOG	Organizational Management funds
	14	Develop model ordinance language for policies such as stormwater, floodplains, subdivisions, building site plans, and sensitive areas, based on existing examples in Iowa, and encourage adoption by ICWMA members	model ordinance language drafted and presented to members	Significant Progress	Comparison of existing post-construction stormwater control ordinances completed and draft ordinance language developed	ECICOG & ICWMA Tech Team & ISWEP	Organizational Management funds
	15	encourage ICWMA members to adopt the Iowa Stormwater Manual as the design standard with each stormwater or related ordinance	adoption by ICWMA Members	In Progress	Draft ordinance language developed for local use	ECICOG & ICWMA Tech Team	ISWEP; IDALS Urban Conservation Program
	16	encourage the development of policies to maximize the use of infiltration based practices in new construction or redevelopment	policy developed; number of members adopting the policies	In Progress	Individual ICWMA member efforts	ICWMA Members	IDALS Urban Conservation Program
	17	develop and/or promote the Urban BMP cost share programs in the metro area	at least 10 projects receiving cost-share	In Progress	Individual ICWMA member efforts	ICWMA Members	Local
	18	complete & adopt a 20 year Comprehensive Watershed Management Plan with 5 year updates	plan adopted by all ICWMA Members; 5 year updates completed	In Progress	Plan developed & adopted	ICWMA Board & stakeholders & ECICOG	ICWMA Tech Team; ICWMA Members
	19	recommend that ICWMA members financially support organizational management of the ICWMA, according to the contribution formula developed by the Board of Directors, to implement the Plan	service agreement for organizational management in place & financially supported	In Progress	FY2016 work plan evaluated & ICWMA Board recommended continued financial support	ICWMA Board & Members & ECICOG	ICWMA Members

Table 6.2 continued

Action Type	Strategy #	Implementation Strategies	Milestone(s)	Status	Accomplishments	Responsible Entity(s)	Technical Resources / Funding Options
Policy	20	develop or update policies to discourage new development in the 100 year & 500 year floodplain	develop model ordinance language	Not yet		ICWMA Members	IFSMA; ICWMA Member Engineering staff
	21	focus on implementing green infrastructure practices as part of the capital improvements planned within the watershed over the next 10 years	implement at least 10 green infrastructure practices in upcoming projects	In Progress	Individual ICWMA member efforts	ICWMA Members	IDALS Urban Conservation Program

Table 6.3 Indian Creek Watershed Action Plan – Practices

Action Type	Strategy #	Implementation Strategies	Milestone(s)	Status	Accomplishments	Responsible Entity(s)	Technical Resources / Funding Options
Practices	22	erosion control practices on construction sites	coordinate enforcement plans; standardize penalties across communities	In Progress	Individual ICWMA member efforts	ICWMA member cities	ISWEP; ICWMA stormwater staff
	23	coordinate a stream corridor maintenance program to include bank stabilization, debris clean-out, & improvements to rock substrate	coordinate activities to maximize results	Not yet		ICWMA member cities & County Road Dept.	ICWMA Members & ICWMA Tech Team
	24	select priority subwatersheds and do modeling to target BMP types and locations	modeling completed	In Progress	GeoTREE Center project to use ArcSLAMM and WinSLAMM together to provide runoff amounts, pollutant loads, and BMP modeling to measure anticipated impact in selected drainage areas	UNI / GeoTREE Center & ICWMA member cities	UNI / GeoTREE Center & IDALS
	25	identify Community Rating System criteria that all communities should meet and determine low-hanging fruit	establish minimum criteria;	Not yet		ICWMA Board	DNR Floodplains
	26	identify areas of repetitive loss due to flooding	map created; communicate findings to the public	Not yet		ICWMA Board & IDNR & Linn SWCD	DNR Floodplains
	27	target tile-drained fields for edge-of-field practices such as wetlands, saturated buffers, and bioreactors	install demo sites: two bioreactors, two saturated buffers, one wetland;-outreach to landowners	In Progress	Curt Zingula’s saturated buffer project with baseline tile outlet water quality samples for evaluation purposes	Linn SWCD & Curt Zingula & Coe College	NRCS cost share program & local land owner
	28	organize and promote creek cleanup events	host two events per year removing at least 5 tons of trash	Not yet		ICWMA Board & Members	Iowa Waste Exchange; DNR Water Trails

Table 6.4 Indian Creek Watershed Action Plan – Monitoring & Measuring Strategies

Action Type	Strategy #	Implementation Strategies	Milestone(s)	Status	Accomplishments	Responsible Entity(s)	Technical Resources / Funding Options
Monitor & Measure	29	continue partnership with Coe College to monitor water quality & quantity	samples collected & analyzed	In Progress	Cedar River Tributary Study: Summer 2015 completed & posted to ICWMA website	ICWMA Board & Members & Coe College	ICWMA Member stormwater staff; Cedar Rapids Utilities Director
	30	track existing and new Best Management Practices (BMPs) using GIS and encourage signage and promotion	tracking method established	Not yet	BMP map developed as part of the Annual Plan Review	ICWMA Board & ECICOG & Members	IDALS Urban Conservationist; ICWMA Member stormwater coordinators
	31	implement water monitoring plan to assess temperature and urban pollutants in priority subwatersheds	urban pollutants monitoring plan developed	Not yet		ICWMA Member cities	IOWATER/DNR Water Monitoring Program; ICWMA Member stormwater coordinators