Cedar Creek steps to an Assessment & Implementation Plan

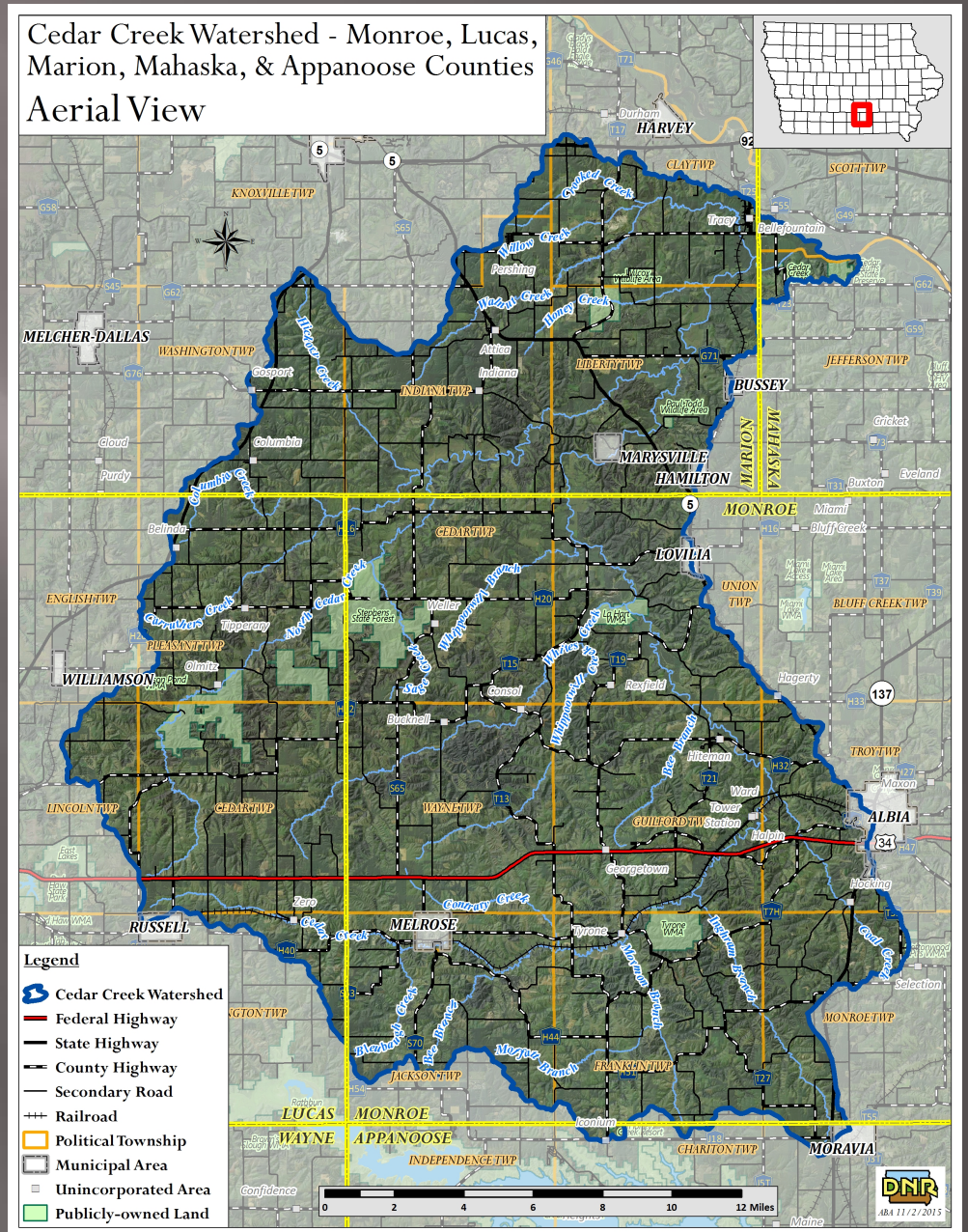
Background Info

- Cedar Creek is a large watershed composed of 14 sub-watersheds extending into five counties. The headwaters start in Lucas County and at the Appanoose - Monroe County line where it extends northward into Marion County. From there the stream outlets into the Des Moines River northeast of Bussy in Mahaska County, Iowa. The Total drainage area is 269,511 acres with 55% of the watershed in Monroe County.

- Due to severe flooding and erosion problems in the Cedar Creek Watershed, the Monroe County SWCD is asking for your support to address many of these issues and improve water quality of the stream.

Sub-watershed Acres By County

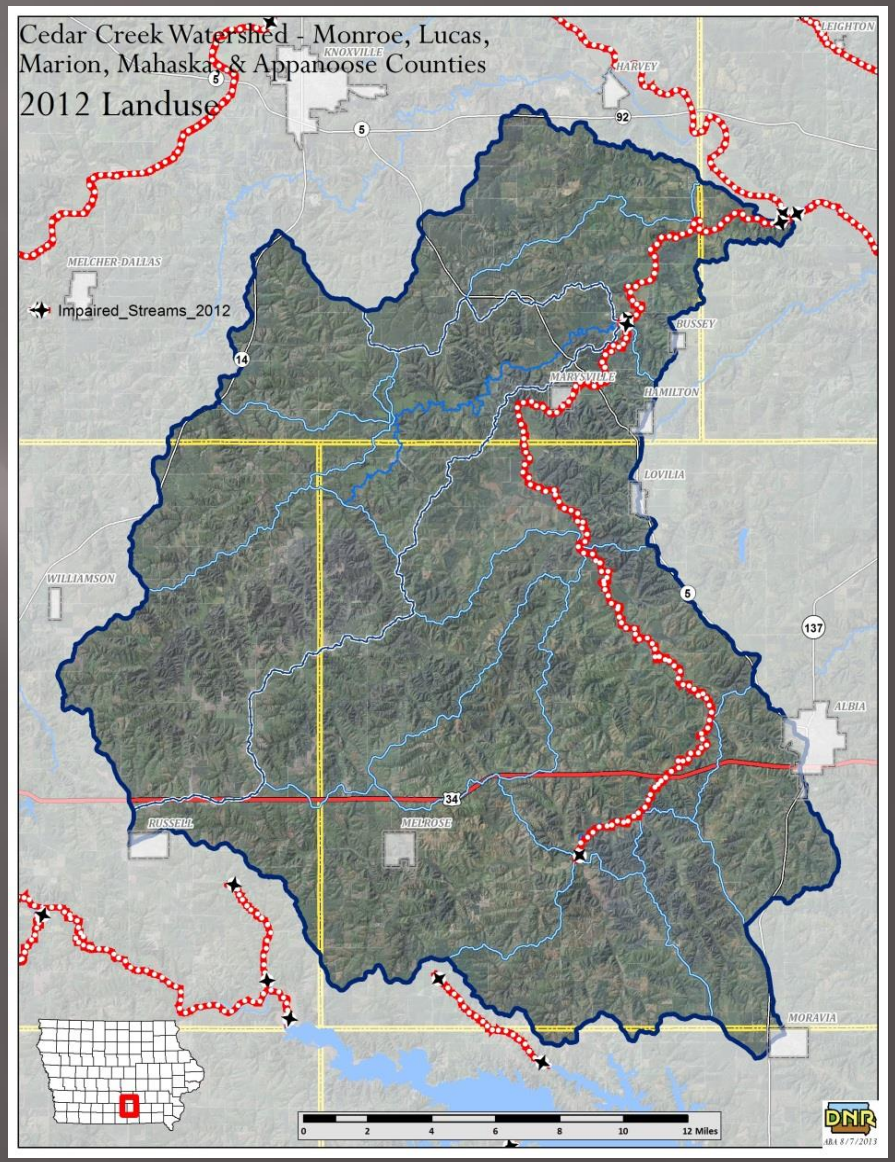
HUC12, County	Acres
Bee Branch-Cedar Creek, MONROE	29923
Bleubaugh Branch, LUCAS	7592
Bleubaugh Branch, MONROE	23845
Carruthers Creek, LUCAS	10880
Carruthers Creek, MARION	3740
Carruthers Creek, MONROE	782
Cedar Creek, MAHASKA	2431
Cedar Creek, MARION	11794
Coal Creek-Cedar Creek, MONROE	12716
Headwaters North Cedar Creek, LUCAS	28535
Headwaters North Cedar Creek, MONROE	6215
Hickory Creek, MARION	12608
Inghram Branch, APPANOOSE	633
Inghram Branch, MONROE	9487
Mormon Branch, APPANOOSE	468
Mormon Branch, MONROE	15086
North Cedar Creek, LUCAS	75
North Cedar Creek, MARION	12950
North Cedar Creek, MONROE	5387
Walnut Creek, MAHASKA	1
Walnut Creek, MARION	18481
Whippoorwill Branch-Cedar Creek, MARION	7185
Whippoorwill Branch-Cedar Creek, MONROE	15995
Whippoorwill Creek, MONROE	11708
Whites Creek, LUCAS	4961
Whites Creek, MONROE	16104



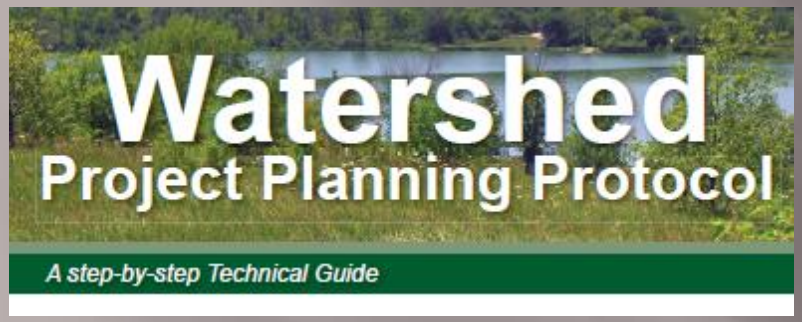
IA's List of Impaired Waters

A large portion of Cedar Creek is listed on the State's 303d Impaired Waters list. The list represents lakes and streams failing to fully support our state's water quality standards.

The Iowa DNR has identified: from N. Cedar Cr. near Bussey (Marion Co.) from confluence with North Cedar Cr. in S15, T74N, R18W, Marion Co. to Mormon Branch in S5,T71N,R18W, Monroe Co)as Designated Use Impaired: aquatic life, Primary Contact: Recreation. Cause of 303(d) listing: biological: Fish Kill: Unknown. This aquatic life assessment is considered "evaluated" because there were not two or more samples collected from this segment in multiple years over a five-year period. According to IDNR's assessment/listing methodology, impairments based on "evaluated" assessments are of lesser confidence and are thus not appropriate for Section 303(d) listing (Category 5 of the Integrated Report). IDNR does, however, consider these impairments as appropriate for listing under either Category 2b or 3b of the Integrated Report (waters potentially impaired and in need of further investigation).



9 Steps of Watershed Planning



IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP

Primary Goal:
To assist local watershed work groups in the development of projects that will address local and state-wide resource concerns to improve water quality.

Secondary Goal:
To generate better water quality projects as well as increase the number of quality projects available for funding.

Plan for Better Water Quality,
Step-by-step.

ftp://ftp-fc.sc.egov.usda.gov/IA/technical/protocolguide.pdf

Forming a Watershed Management Authority (WMA)

Step 1

- The watershed organization shall be a political subdivision of the State of Iowa and a legal entity separate and distinct from the corporate existence of any participating parties and shall be subject to the control and supervision of any party or their officers and directors only to the extent provided. **To be a legal entity of the State of Iowa the group must have a signed copy of a 28E agreement on record. Iowa Chapter Code 28E and Code Chapter 466B states that all incorporated cities, soil & water conservation districts, and other governmental entities within the watershed are invited to become a participant in the agreement.**

Step 2

- A working agreement(28E Agreement) was established between the political subdivisions in all five counties (Soil & water Conservation Districts, County Board of supervisors and incorporated cites) which will collaborate to to achieve watershed improvements, more specifically, resources needed to plan for and implement voluntary hazard mitigation and water quality programming.

Step 3

- The working agreement or leagal document(28E Agreement) was filed with the Sate of Iowa on August 13th 2015 formally establishing the South Central IA Cedar Creek WMA.

Step 4

- Members participating in the 28E Agrement are entitled to appoint one (1) representative and one (1) alternate representative to serve as a Director to seve on the WMA Board, which will conduct all affairs for the Authority.

Step 5

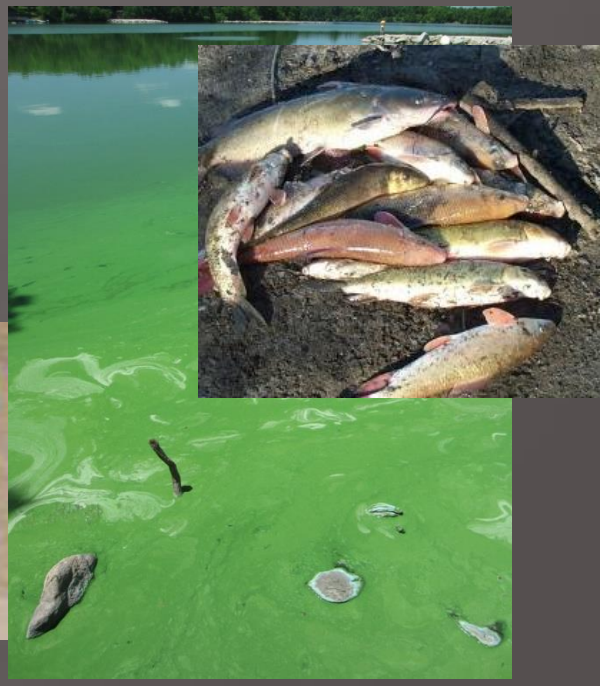
- As a non-profit organization, the South Central IA Cedar Creek WMA will welcome any contributions in efforts to acheive goals set fouth by the WMA Board.

9 Steps of Watershed Planning & Assessment

- Identify water quality concern(s)
- Determine reasonable objectives
- Inventory watershed(s)
- Analyze watershed data
- Formulate alternatives
- Evaluate alternatives
- Make decisions & complete plans
- Implement
- Evaluate

Step 1 - Identifying Resource Concerns

- Flooding Issues
- Gully & Sediment Erosion
- Water Quality
- Hydrologic
- Management Land Use
- Livestock Impact



Step 2 – Determine Reasonable Objectives

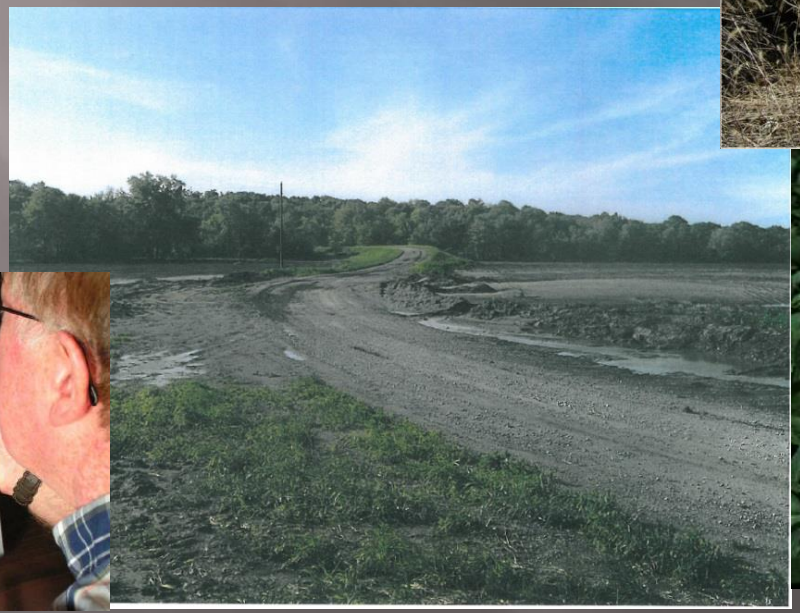
- **Assemble a local work group to help determine reasonable, yet meaningful, objectives for the stream and watershed**
- **Objectives should be quantifiable in order to measure progress**
- **Examples:**
  1. **Maintain/improve the integrity of the waterbody by preventing future degradation**
  2. **Reduce pollutant load to an acceptable level or to the allocation assigned in a TMDL**
  3. **Improve recreational opportunities and economic benefits in a measurable way**

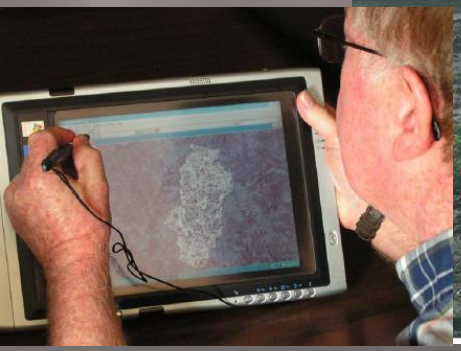
Step 3 – Inventory of Watershed

Goal: Identify High Priority Areas to determine where to install Best Management Practices

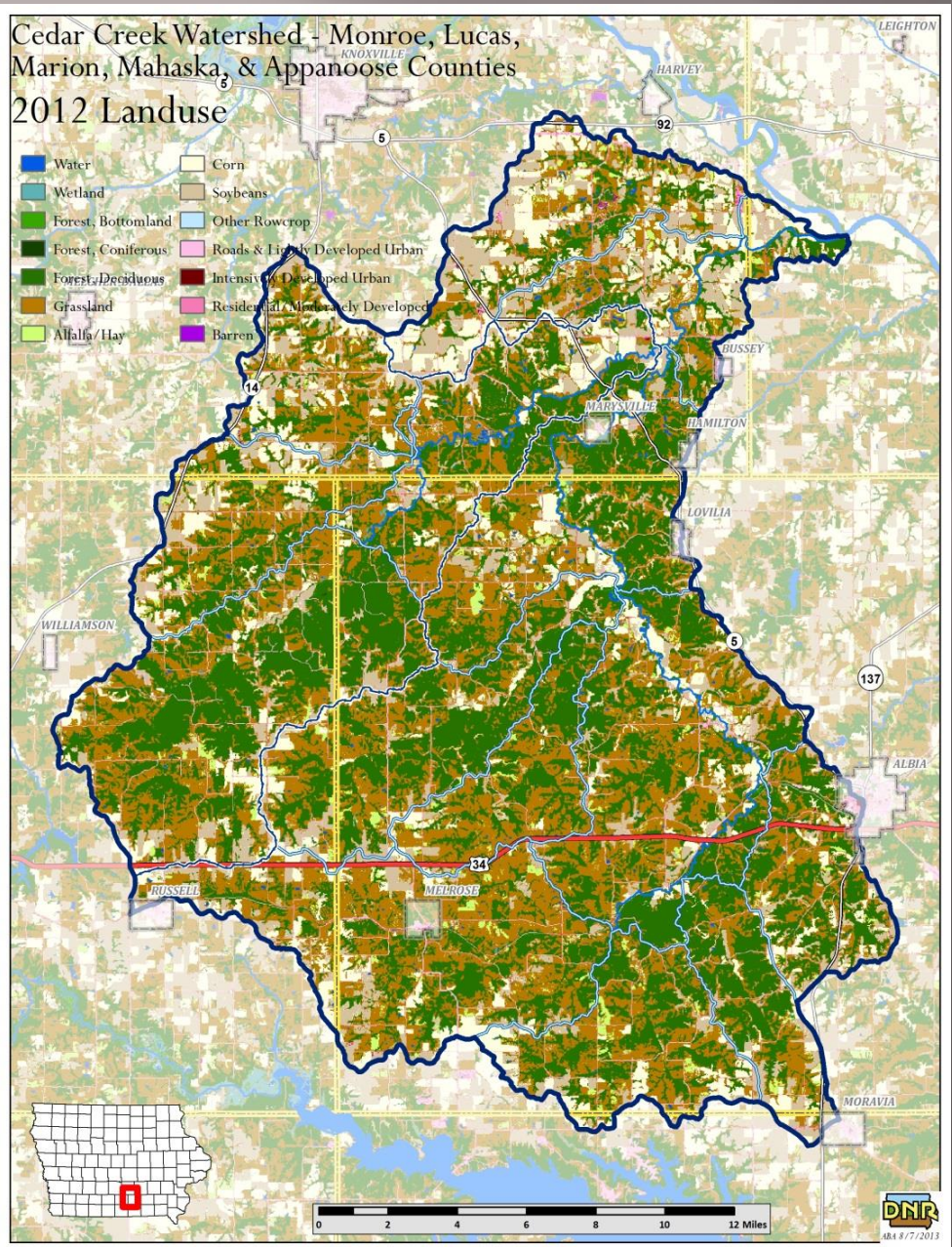
Steps:

- Data Collection
- GIS Analysis & Map Production
- Identify erosion & sediment delivery areas
- Identify point and nonpoint issues
- Implementation
- Model Impacts





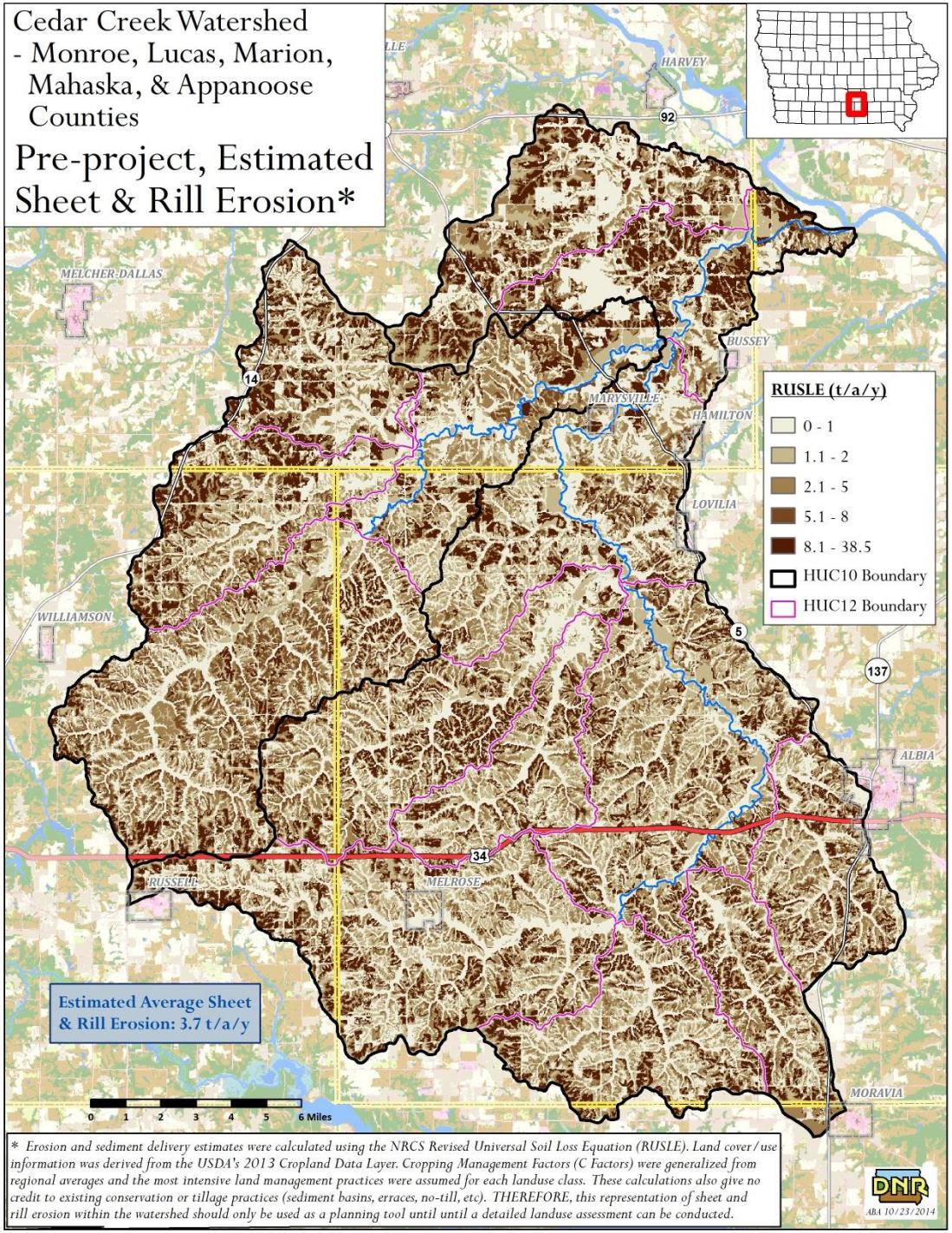
Step 4 - Analyze Watershed Data

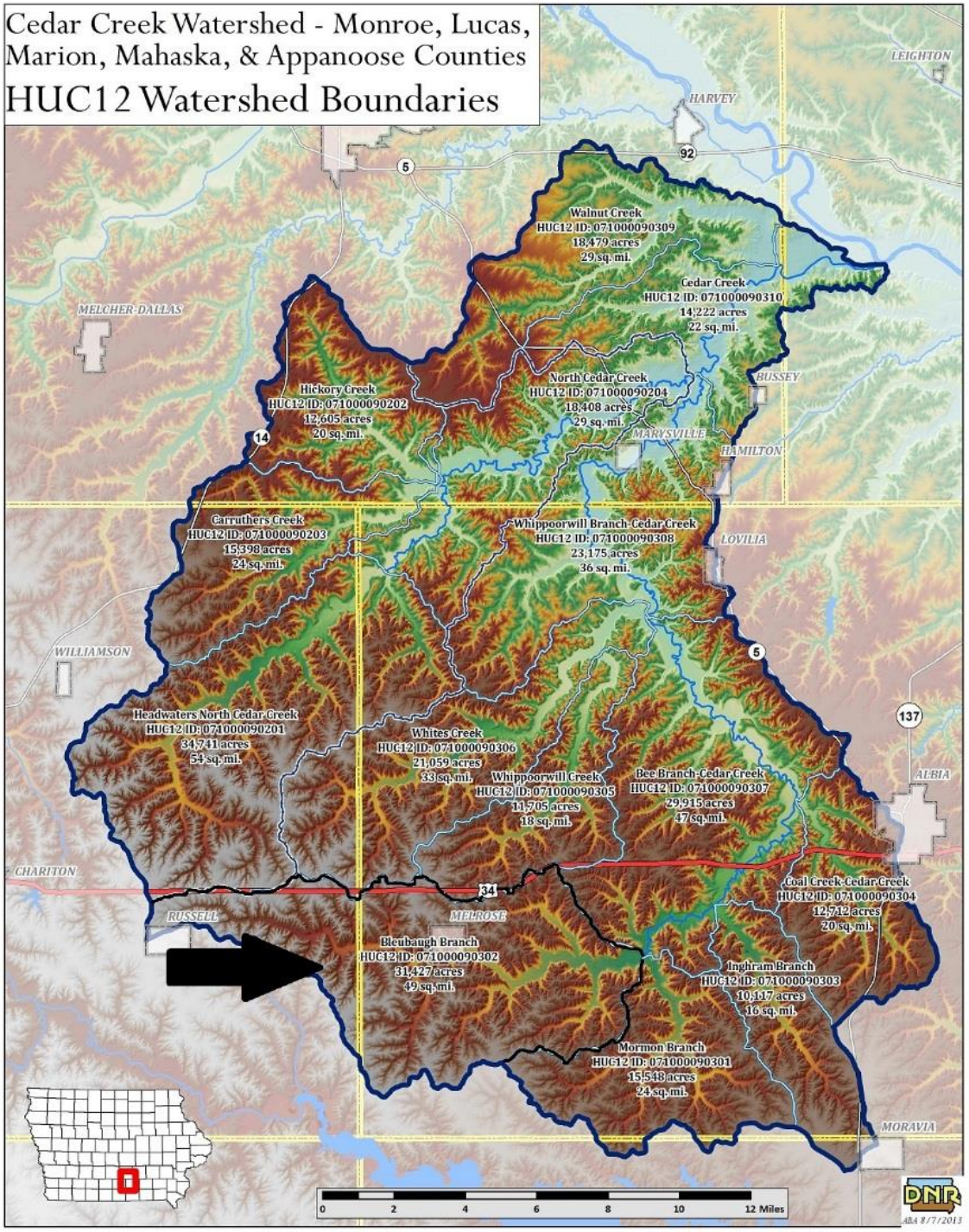


- Analyze gathered data to determine if it supports the initial concerns & objectives
- Verify loading estimates to assure accuracy
- Identify locations and character of Natural Resource concerns
- Examine survey results for stakeholder & priority landowners understanding & willingness to participate

Evaluation & Inventory

- Analyze land uses:
  - 1. Rotations/Tillage (# of Acres and Quantities)
  - 2. Management & Costs (Nutrient, Rotations, Residue, Pest and Irrigation)
  - 3. Land use Effects (Soil Health, Sheet & Rill Erosion, Water quality, Flood Risk Areas)
  - 3. Livestock Management
  - 4. Existing infrastructures


Cedar Creek Watershed
- Monroe, Lucas, Marion, Mahaska, & Appanoose Counties
Pre-project, Estimated Sheet & Rill Erosion*
HARVEY
92
MELCHER-DALLAS
14
BUSSEY
MARYSVILLE
HAMILTON
LOVILIA
WILLIAMSON
5
137
ALBIA
34
RUSSELL
MELROSE
MORAVIA
RUSLE (t/a/y)
0 - 1
1.1 - 2
2.1 - 5
5.1 - 8
8.1 - 38.5
HUC10 Boundary
HUC12 Boundary
Estimated Average Sheet & Rill Erosion: 3.7 t/a/y
0 1 2 3 4 5 6 Miles
* Erosion and sediment delivery estimates were calculated using the NRCS Revised Universal Soil Loss Equation (RUSLE). Land cover/use information was derived from the USDA's 2013 Cropland Data Layer. Cropping Management Factors (C Factors) were generalized from regional averages and the most intensive land management practices were assumed for each landuse class. These calculations also give no credit to existing conservation or tillage practices (sediment basins, erraces, no-till, etc). THEREFORE, this representation of sheet and rill erosion within the watershed should only be used as a planning tool until until a detailed landuse assessment can be conducted.
DNR
ABA 10/23/2014


Cedar Creek Watershed - Monroe, Lucas, Marion, Mahaska, & Appanoose Counties
HUC12 Watershed Boundaries
Walnut Creek
HUC12 ID: 071000090309
18,479 acres
29 sq. mi.
Cedar Creek
HUC12 ID: 071000090310
14,222 acres
22 sq. mi.
North Cedar Creek
HUC12 ID: 071000090204
18,408 acres
29 sq. mi.
Hickory Creek
HUC12 ID: 071000090202
12,605 acres
20 sq. mi.
Carruthers Creek
HUC12 ID: 071000090203
15,398 acres
24 sq. mi.
Whippoorwill Branch-Cedar Creek
HUC12 ID: 071000090308
23,175 acres
36 sq. mi.
Headwaters North Cedar Creek
HUC12 ID: 071000090201
34,741 acres
54 sq. mi.
Whites Creek
HUC12 ID: 071000090306
21,059 acres
33 sq. mi.
Whippoorwill Creek
HUC12 ID: 071000090305
11,705 acres
18 sq. mi.
Bee Branch-Cedar Creek
HUC12 ID: 071000090307
29,915 acres
47 sq. mi.
Coal Creek-Cedar Creek
HUC12 ID: 071000090304
12,712 acres
20 sq. mi.
Bleubaugh Branch
HUC12 ID: 071000090302
31,427 acres
49 sq. mi.
Inghram Branch
HUC12 ID: 071000090303
10,117 acres
16 sq. mi.
Mormon Branch
HUC12 ID: 071000090301
15,548 acres
24 sq. mi.
LEIGHTON
HARVEY
MELCHER-DALLAS
BUSSEY
MARYSVILLE
HAMILTON
LOVILIA
WILLIAMSON
ALBIA
CHARITON
RUSSELL
MELROSE
MORAVIA
92
5
14
137
34
0 2 4 6 8 10 12 Miles

Step 5 & 6 –Formulate & Evaluate Alternatives

- Using priority areas can help determine best management practices to address resource & water quality concerns.

Things to consider:

1. Develop alternatives that are financially and technically feasible
2. Alternatives should be summarized including cost, pollutant reduction effectiveness & potential locations
3. Identify feasibility of best management practice based on social, financial, technical and political considerations

Step 7 - Make Decisions & Planning Process

- The local work group, in consultation with stakeholders and the watershed planner, should lead decision making.
- The decisions made at this level will become an application to funding agencies/organizations. The plan will identify priorities and target cost-effective alternatives for measurable results. Development of the work plan will comprise the full application for a fundable project.
- Determine local funding, leadership. In-kind contributions, etc.
- Incorporate objectives, staff, technical assistance into final work plan.

Step 8 - Implement Assessment Plan

- Prioritize implementation, secure funding and begin construction or implementation of best management practices that address objectives.

Assessment Tools

Tools and resources utilized:

1. Hydrology Study
2. GIS Data
2. Base Maps, Lidar maps, Aerial photos, Topography and Soils maps
3. Floodplain Risk Mitigation Tool
4. RUSLE (Revised Universal Soil Loss Equation)
5. Water Monitoring

Step 9 -Evaluation

- Measure progress towards water quality or other project objectives. If necessary make adjustment in order to achieve success.