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"If you clean it, they will come"

Field of Dreams Watershed & Water Trail

Stream Restoration, the Iowa DNR River Restoration Toolbox and a Vision for Change!

Judith E. Joyce, PWS
Principal & Senior Geomorphologist

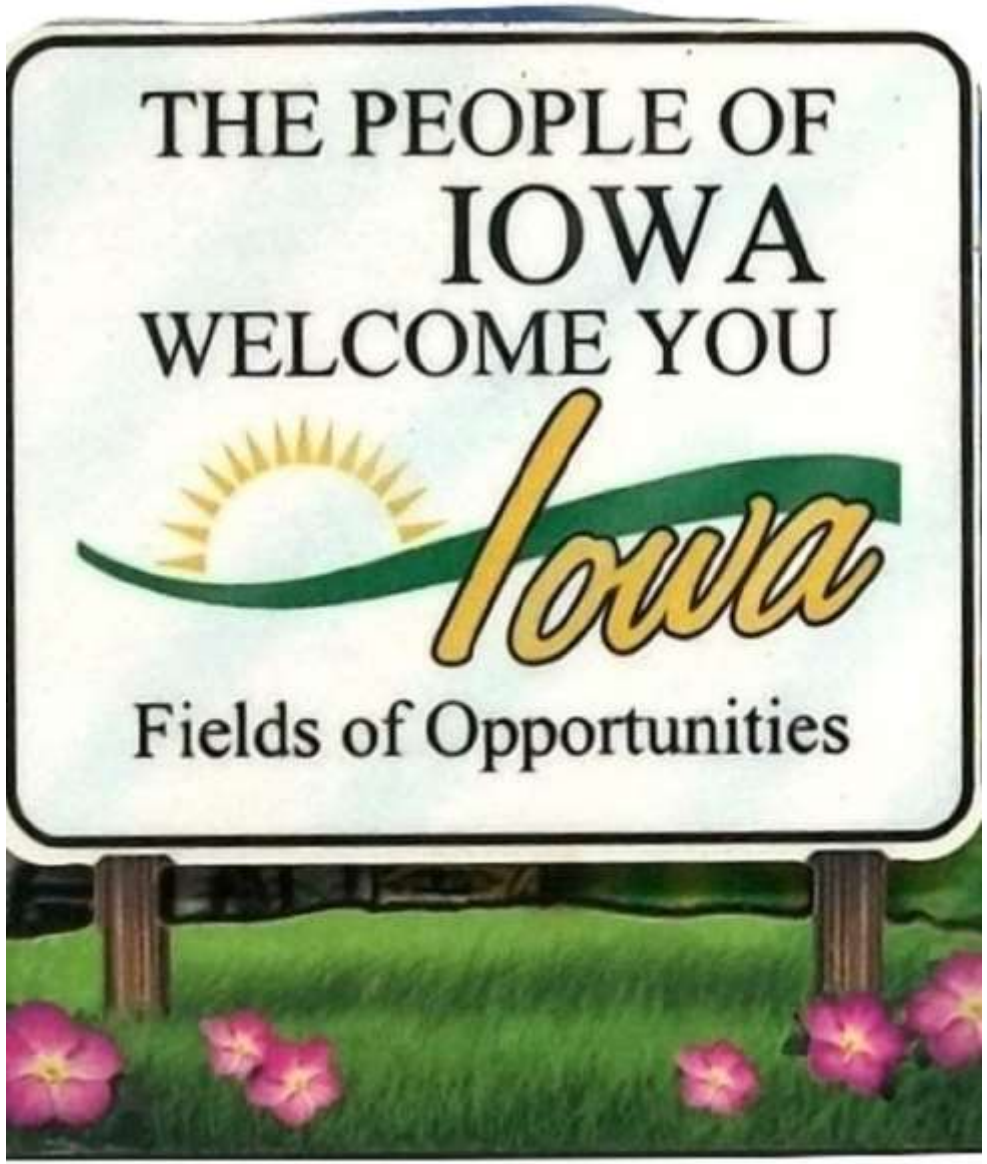
Reid Stamer, PWS
Stream Restoration Ecologist

Connecting Communities to Water

Water Quantity
Water Quality
Rivers and Streams
Lakes & Ponds
Wetlands

IOWA?


-96°40'
-93°20'
-90°00'
43°40'
40°20'
west
south
maphill
© 2011 Maphill



IOWA CORN®

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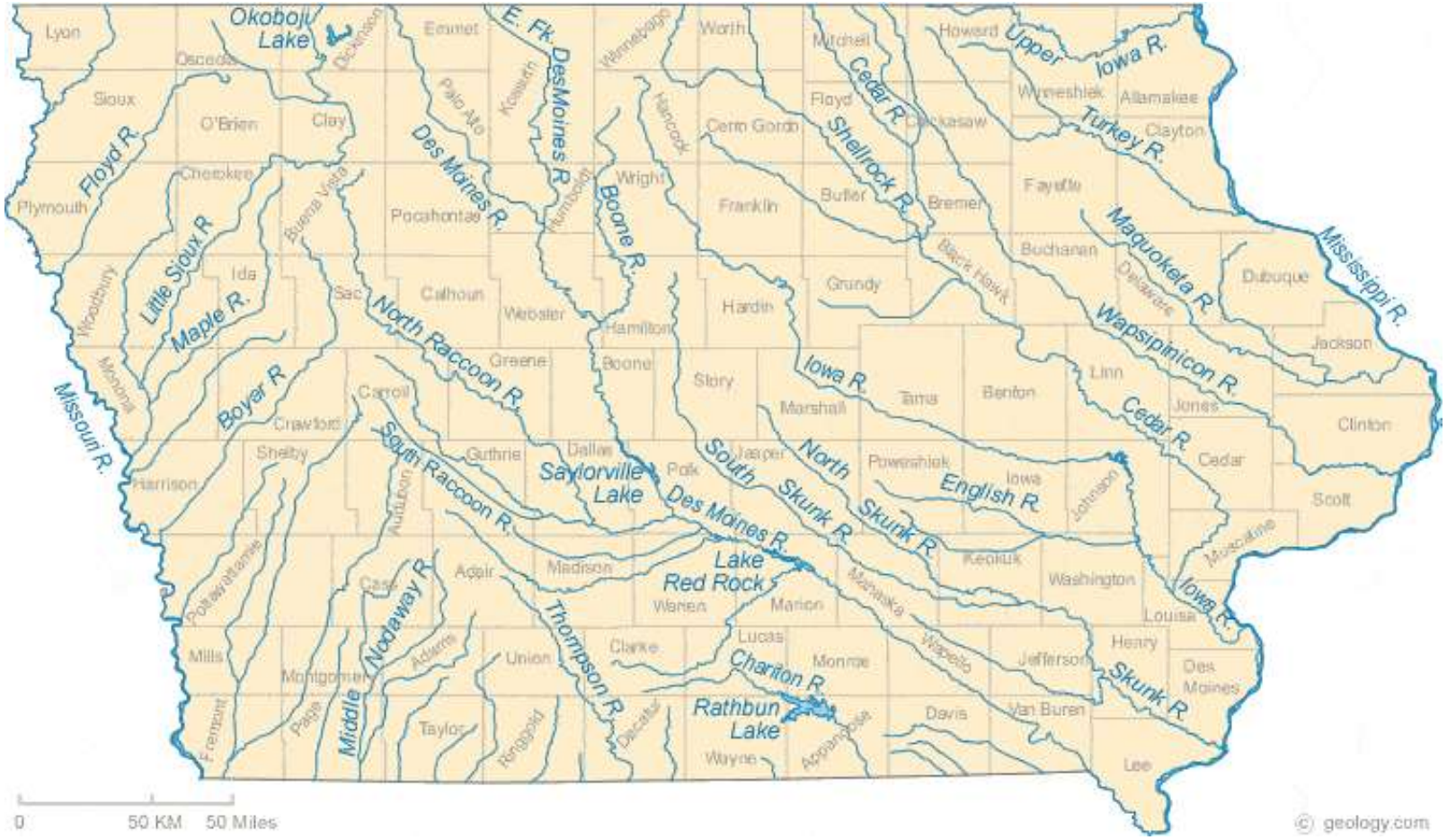
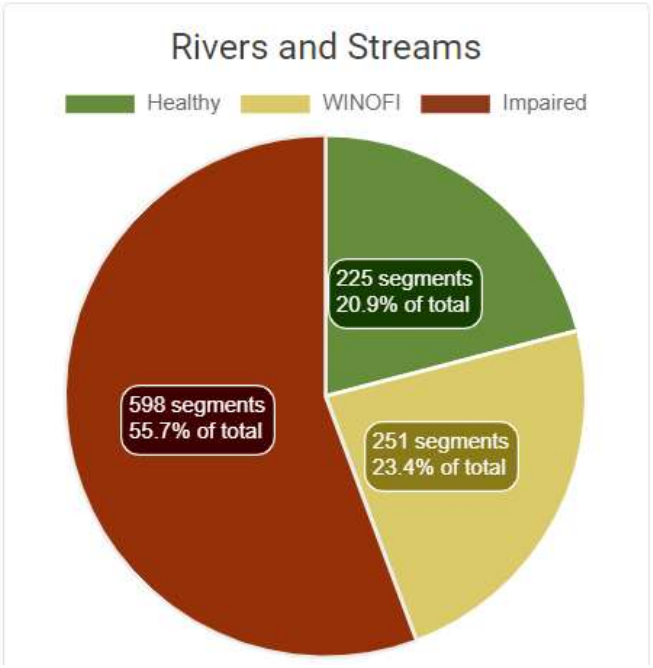
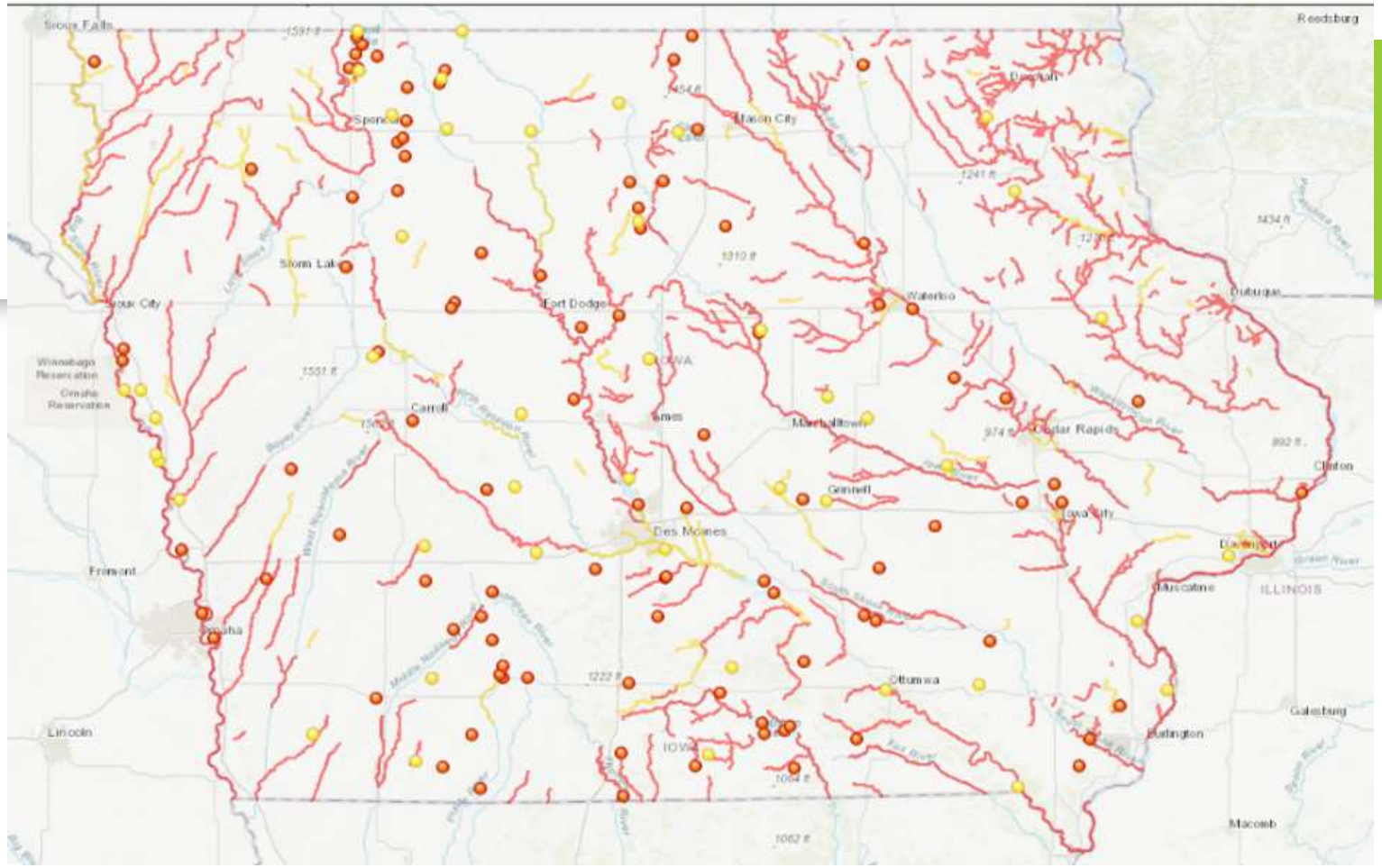
Iowa has 27,000 miles of perennial streams



Flooding





Water Quality: Impaired Waters

https://programs.iowadnr.gov/adbnet/Assessments/Summary/2022

Iowa's Nutrient Reduction Strategies goals

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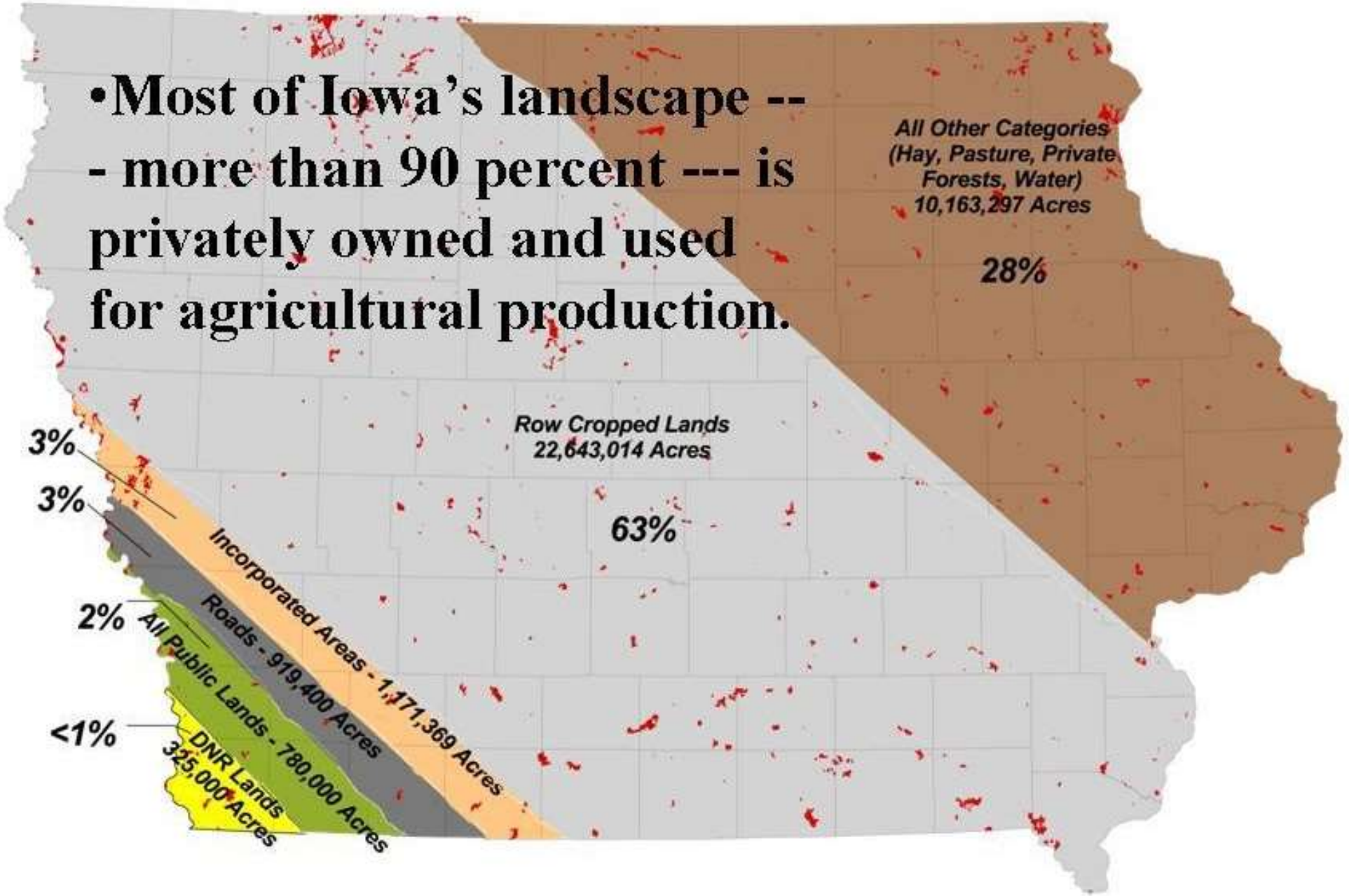
How do we connect Iowans to the water?



All public lands = 2%

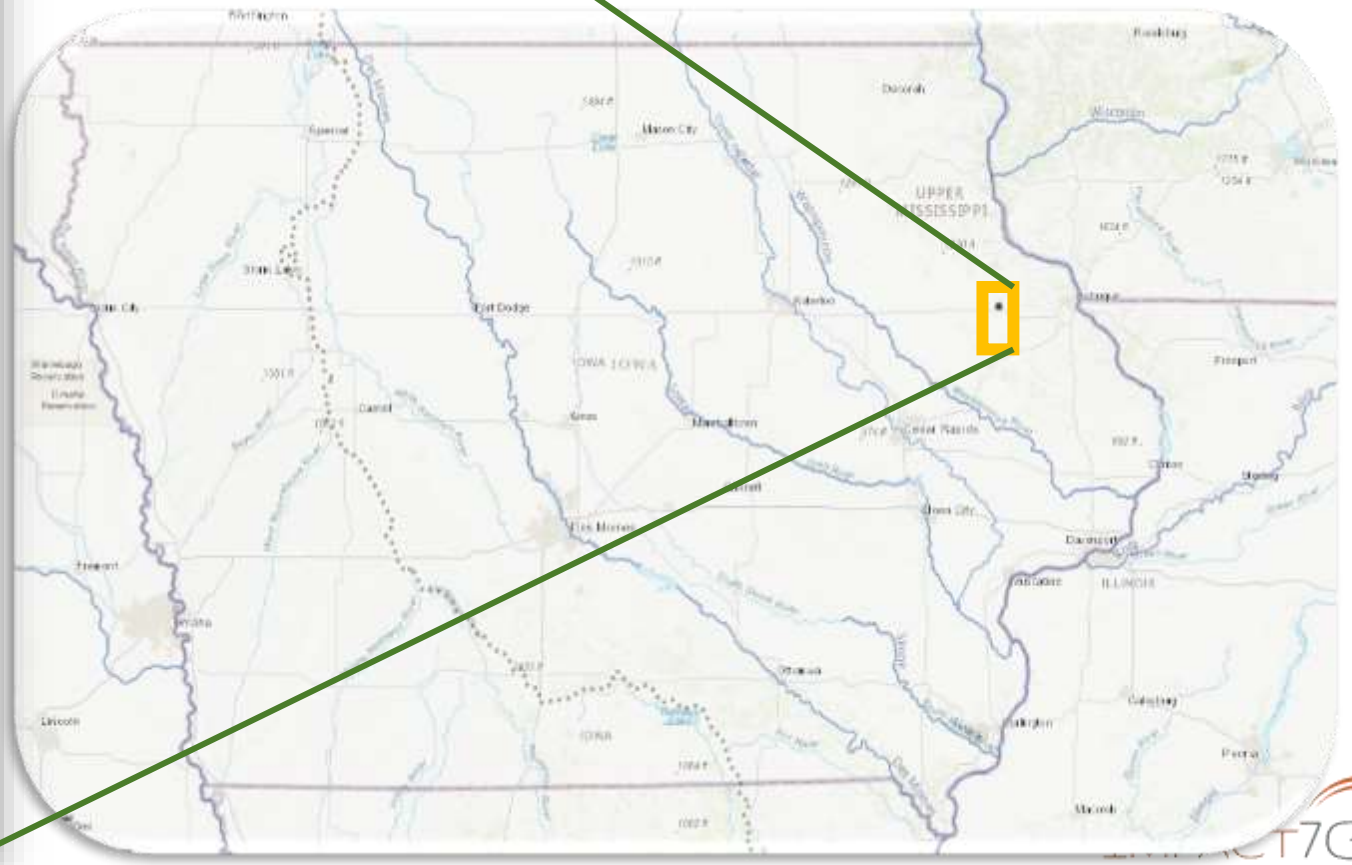
DNR lands = less than 1%

Source: Iowa Department of Natural Resources

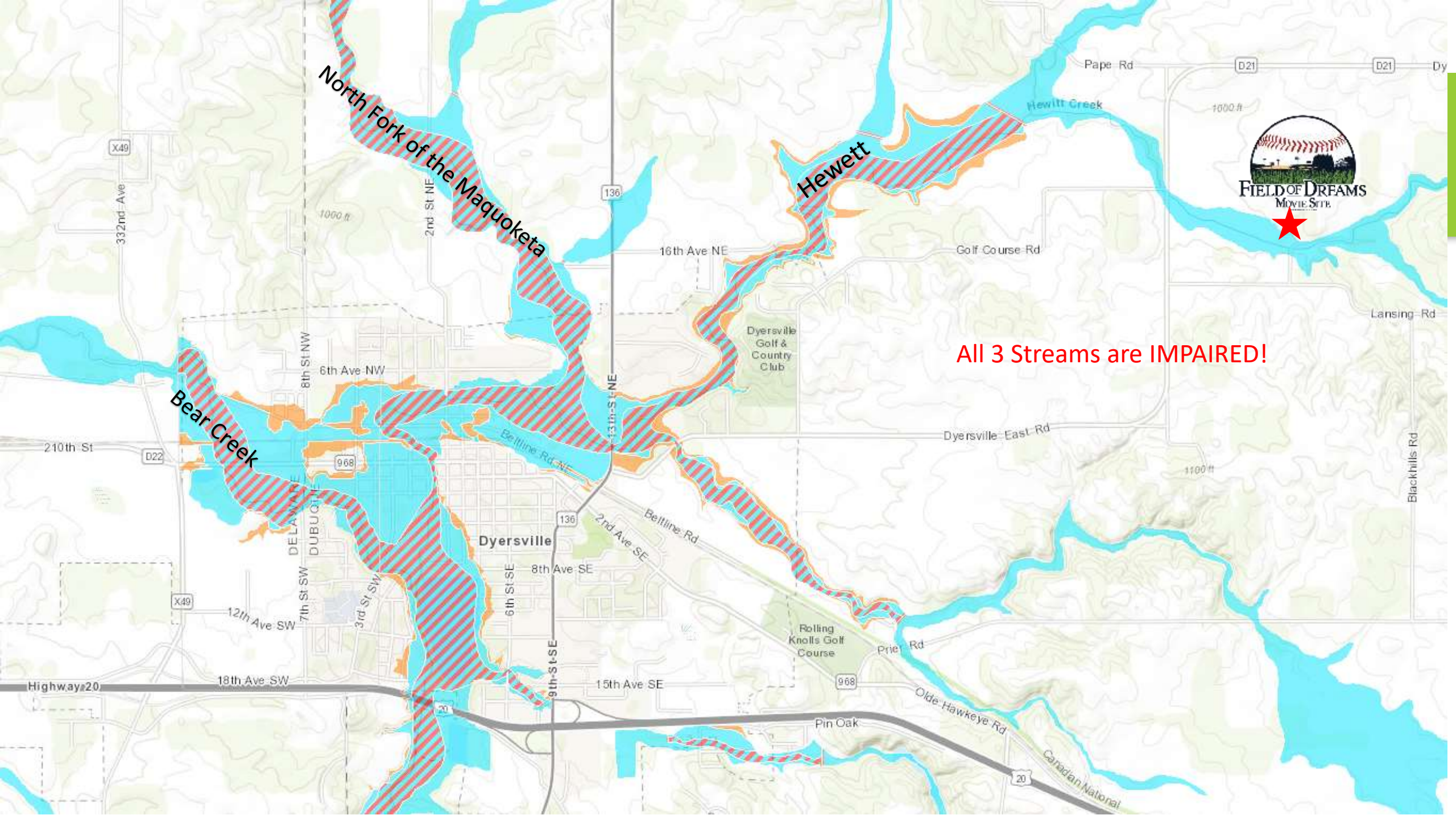
What we needed was a Poster Child for WATER?

Driftless Area Scenic Byway

Headwaters of the North Fork Maquoketa River (HUC 10 0706000608)



The “Field of Dreams” Watershed


North Fork of the Maquoketa
Hewett
Bear Creek
All 3 Streams are IMPAIRED!
Dyersville
Pape Rd
Hewitt Creek
Field of Dreams Movie Site
16th Ave NE
Golf Course Rd
Dyersville Golf & Country Club
Lansing Rd
Blackhills Rd
Dyersville East Rd
Beltline Rd NE
Beltline Rd
2nd Ave SE
8th Ave SE
6th Ave NW
210th St
12th Ave SW
18th Ave SW
15th Ave SE
Highway 20
Rolling Knolls Golf Course
Prier Rd
Olde Hawkeye Rd
Pin Oak
Canadian National
332nd Ave
2nd St NE
8th St NW
13th St NE
7th St SW
6th St SE
9th St SE
3rd St SW
DELAWARE
DUBUQUE
X49
D22
D21
136
968
20
1000 ft
1100 ft

What is the Community's relationship with its streams?

- Streams get the communities full attention during floods
- After events, efforts are made to address flooding and flood mitigation

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What is the relationship with the streams in a "Normal" and "Low Flow"?

The Streams are Ignored!

- Hidden
- Limited access
- Limited recreational opportunities
- Poor aesthetics
- No connection to the community!

Normal and Low flows are 99% of the time!

Now that we have the community's attention…

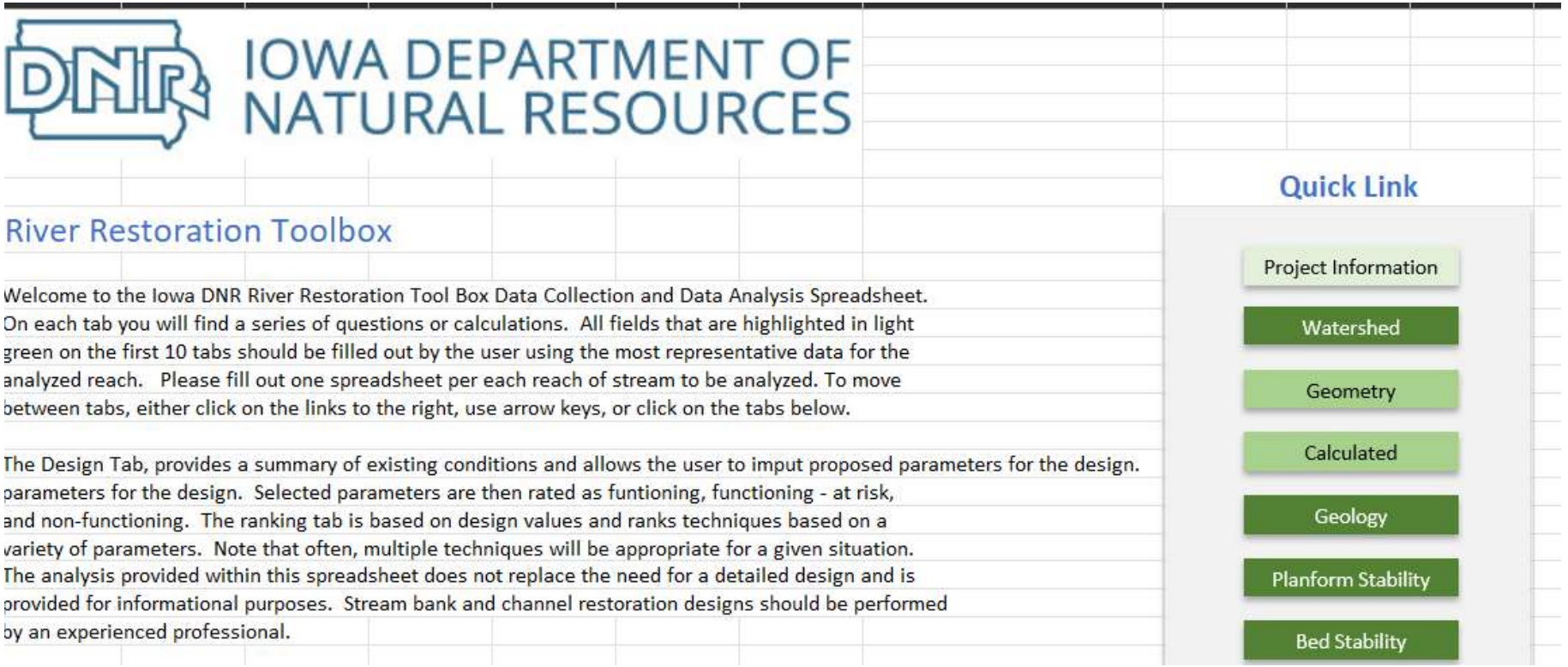
How do we pay for it?!

Funding Sources Required a Design Standard

Reviewers needed training

Check list to assure success

Iowa's River Restoration Toolbox (IRRT)



IOWA DEPARTMENT OF NATURAL RESOURCES

River Restoration Toolbox

Welcome to the Iowa DNR River Restoration Tool Box Data Collection and Data Analysis Spreadsheet. On each tab you will find a series of questions or calculations. All fields that are highlighted in light green on the first 10 tabs should be filled out by the user using the most representative data for the analyzed reach. Please fill out one spreadsheet per each reach of stream to be analyzed. To move between tabs, either click on the links to the right, use arrow keys, or click on the tabs below.

The Design Tab, provides a summary of existing conditions and allows the user to imput proposed parameters for the design. parameters for the design. Selected parameters are then rated as funtioning, functioning - at risk, and non-functioning. The ranking tab is based on design values and ranks techniques based on a variety of parameters. Note that often, multiple techniques will be appropriate for a given situation. The analysis provided within this spreadsheet does not replace the need for a detailed design and is provided for informational purposes. Stream bank and channel restoration designs should be performed by an experienced professional.

Quick Link

Project Information

Watershed

Geometry

Calculated

Geology

Planform Stability

Bed Stability

IRRT

What it is

- Macro-enabled spreadsheet
- Assessment *tool*
- BMP Guidelines
- Checklist for Funders / Reviewers

What it is NOT

- Fully comprehensive assessment tool
- Final word in stream restoration
- Autonomous design platform

IRRT – Interface

Stream Restoration Technique Recommendations

Click "Calculate" button at right to populate "Recommendations" table below

Calculate

Grade Control		
Rock Arch Rapids	0%	
Cross Vane	0%	
W-Weir	0%	
Step-Pool Structure	0%	
Rock & Log Riffle	100%	
Grouted Grade Control	0%	
Rock Constructed Riffle	100%	
Vegetation Restoration		
Live Staking / Joint Planting	92%	
Live Fascines	92%	
Brush Layering	92%	
Erosion Control Matting	92%	
Sod Matting	92%	
Riparian Buffering		
Restoration / Establishment	96%	

Clear Conditions | Re-Calculate

	Existing Conditions	Design Conditions
25 Width of Flood-Prone Area (W_{FPA})	2.07	1.00
Click button to See Line Art Drawing 9 (View	2.05	1.43
26 Average Pool to Pool Spacing (P_S)	90.50	90.00
Click button to See Line Art Drawing 5 (View	260.00	260.00
27 Belt Width (W_{BLT})	163.12	163.12
Click button to See Line Art Drawing 10 (Vie	427.59	427.59
	2.87	2.89
28 What is the dominant BEHI Rating?	Stage IV	Stage VI
high	high	low
Click button to See Line Art Drawing 20 (Vie	Perennial Vegetation 0 to 50 feet beyond Belt Width	Perennial Vegetation 0 to 50 feet beyond Belt Width
29 What is the D_{50} of the reach?	27.76	40.00
For Bedrock enter 2048 mm	63.00	120.00
	5.40	3.75
Click button to See Line Art Drawing 11 (Vie	7.20	5.20
	1.55	1.50
	8.52	17.78
30 Bankfull discharge (Q_{BKF})	0.0570	0.0470
Validate with combination of field and desk	4.37	5.00
Bankfull discharge is less than the 2-year (5	B5c	B5c
Method - select from drop down list	1105.00	1320.00
Darcy-Weisbach	sand (0.062 mm - <2 mm)	sand (0.062 mm - <2 mm)
U/U*	single thread	single thread
Manning	No	No
Bankfull width verified less than Iowa Flood Information System 50 percent innu	1.44	1.00
StreamStats Peak-Flow report		
Nearby gauge, statistical analysis of peakflows between 1-2 year range associat		

Darcy-Weisbach	243
U/U*	257
Manning	46.2
Bankfull width verified less than Iowa Flood Information System 50 percent innu	324
StreamStats Peak-Flow report	275
Nearby gauge, statistical analysis of peakflows between 1-2 year range associat	

IFIS Innundation | USGS StreamStats

Presence of Nearby Infrastructure

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IRRT – Project Review

73 List of minimum design documents for review.

a. Plan view drawing
b. Profile view drawing (existing and proposed)
   Click button to See Line Art Drawing 5 (View 5) Longitudinal Profile
c. Channel alignment geometry
d. Typical cross sections
e. Minimum of 3 site photos, including vegetation (more for larger project areas)
f. This spreadsheet is part of the submittal
g. Bankfull stage and discharge determination report
h. Floodplain risk gradient map

IOWA Flood Risk

74 List of minimum data to be provided

a. Profile (*.csv)
b. Cross section at a riffle (*.csv)
   Click button to See Line Art Drawing 3 (View 3) Survey Figure
c. Cross section at a representative pool (*.csv)
d. Cross section at most erosive bank (if a goal is reducing streambank erosion) (*.csv)
e. Velocity/Discharge calculations
f. Riffle/Reach pebble count
   Click button to See Line Art Drawing 11 (View 11) Pebble Counts
g. Gradation of bar sample (if applicable)

* When using Geomorphic Channel design practice, see Practice Guide 5, sections 2.8 and 2.9 for checklists of minimum report and plan requirements.

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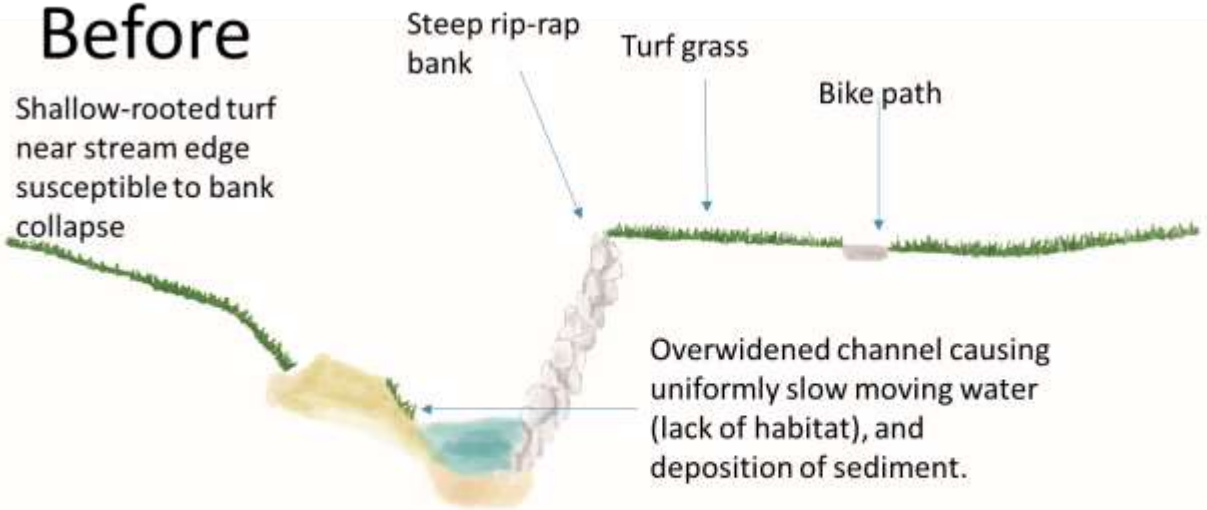
Funding!

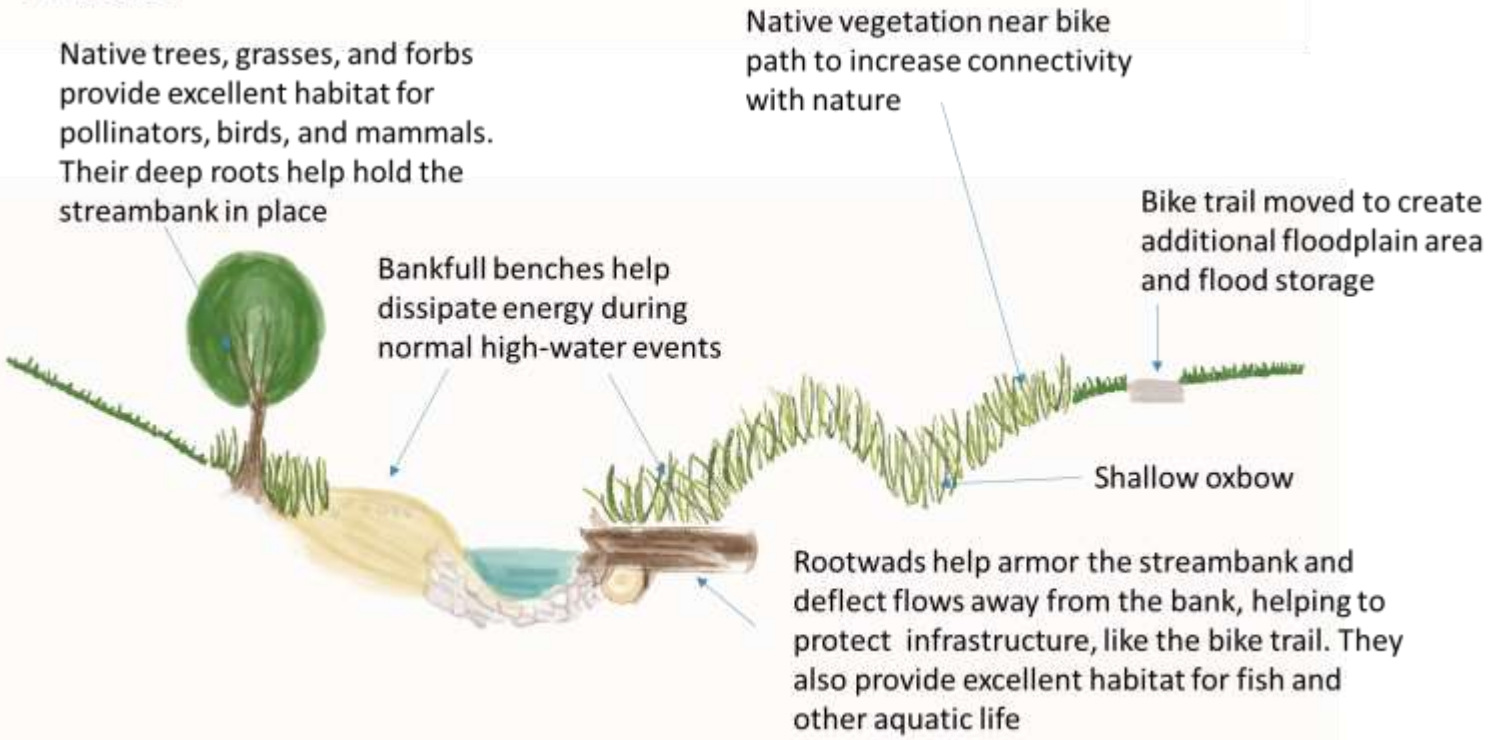
Meanwhile in Dyersville…

Bear Creek – Ignored!

Before



After



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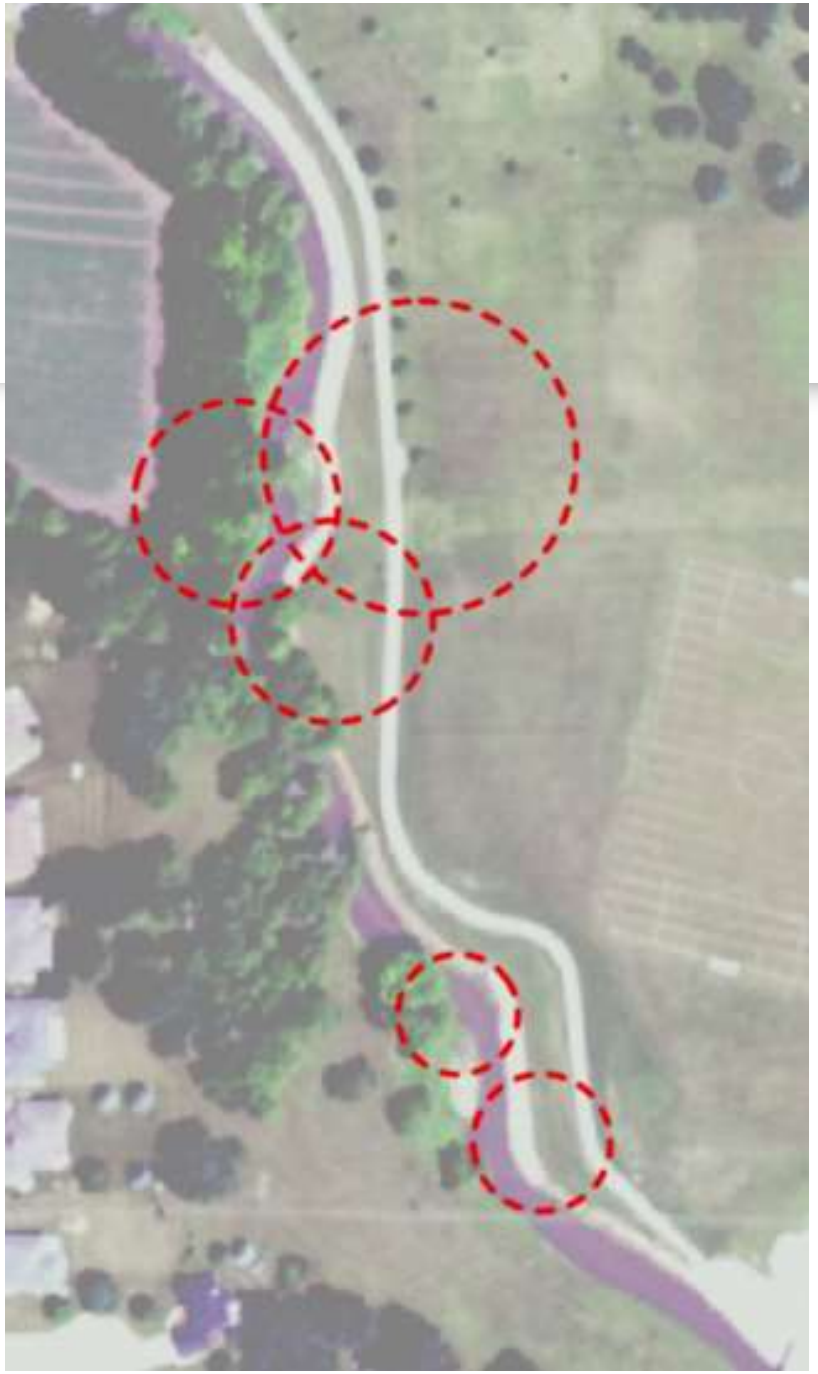
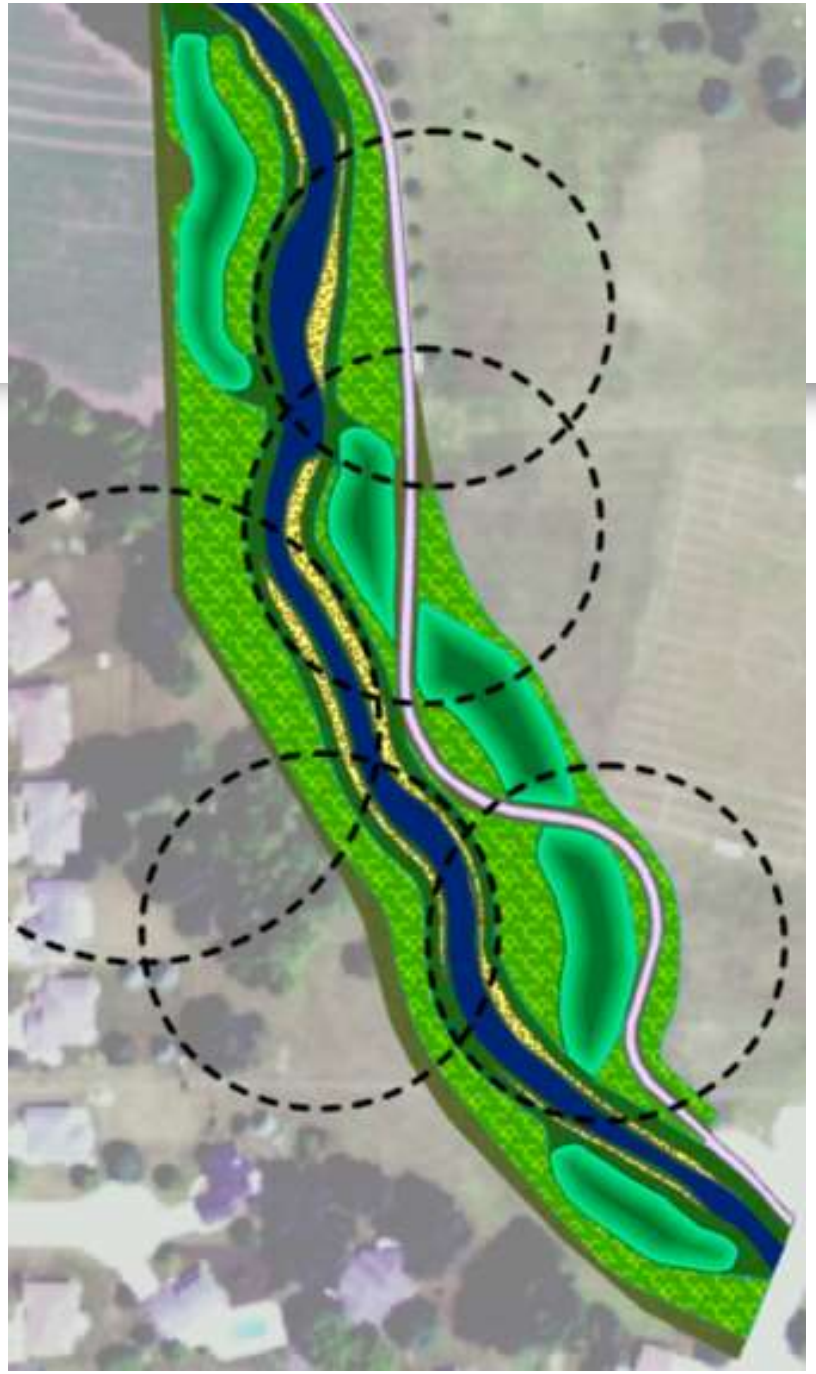
5th St SW
4th Ave SW
Bear Creek
3rd St SW
Bear Creek
3rd St SW
5th St SW
8th Ave SW

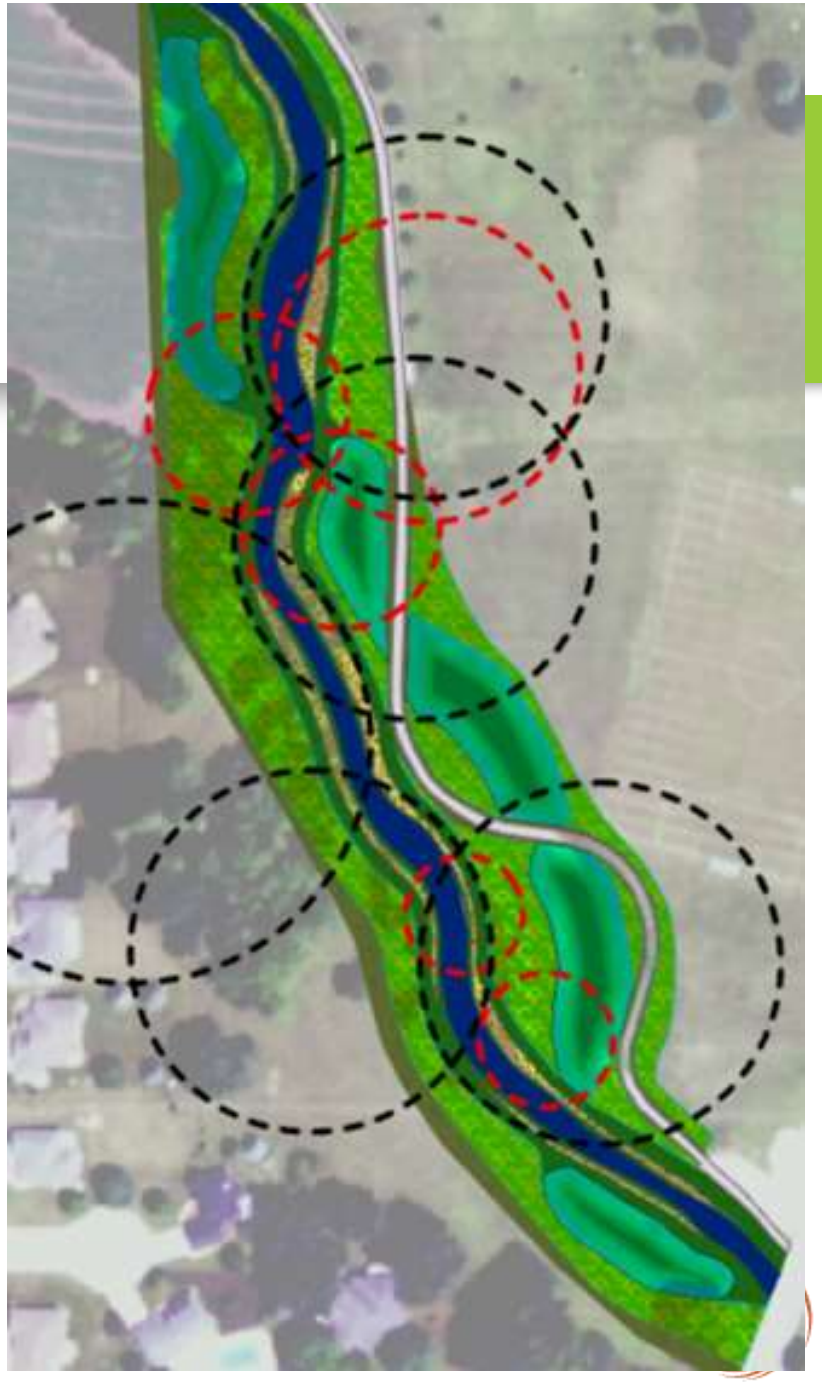
IMPACT7G

5th St SW
4th Ave SW
Bear Creek
3rd St SW
Bear Creek
3rd St SW
5th St SW
8th Ave SW

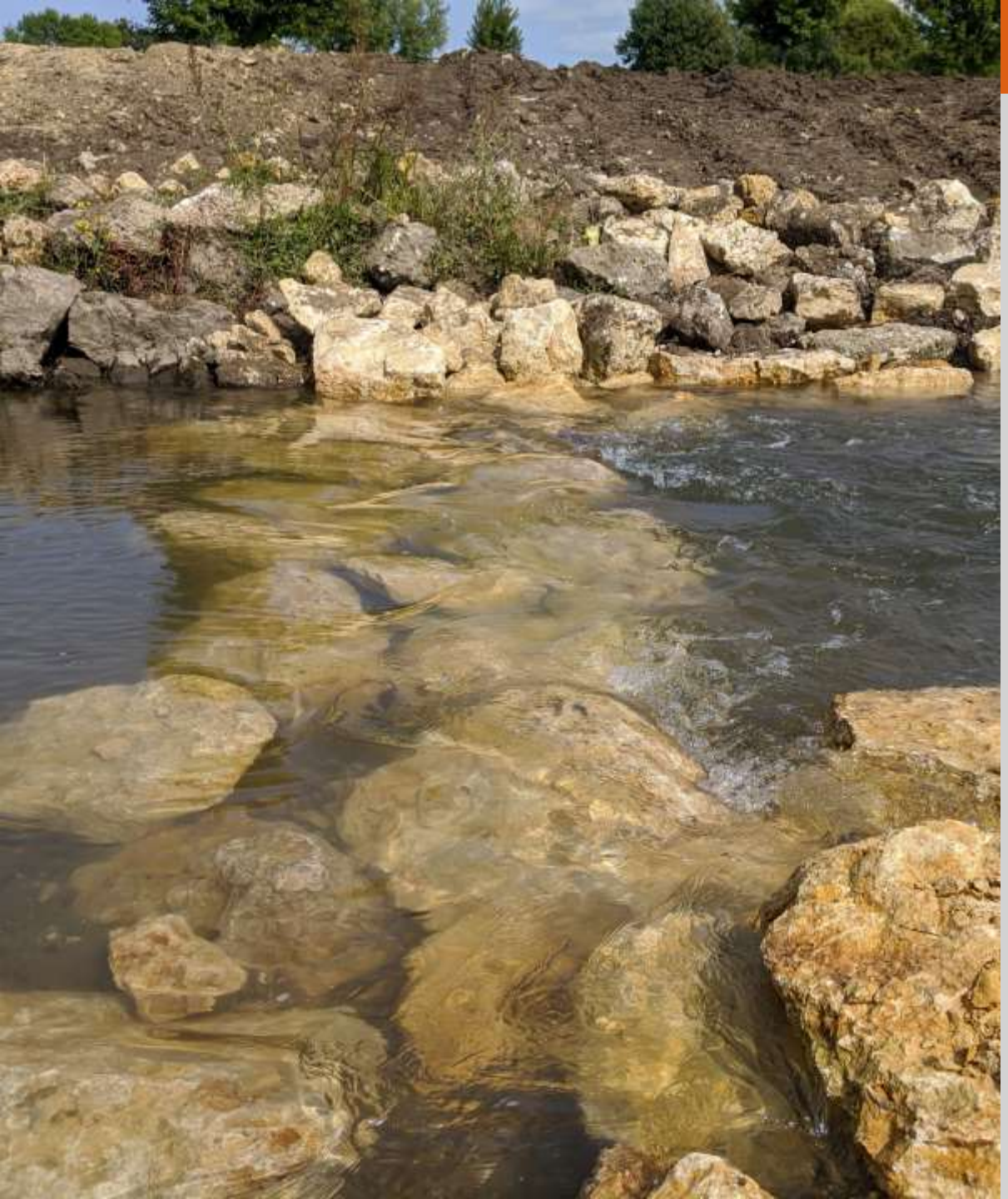
4th Ave SW
Bear Creek
3rd St SW
Bear Creek
3rd St SW
5th St SW
8th Ave SW



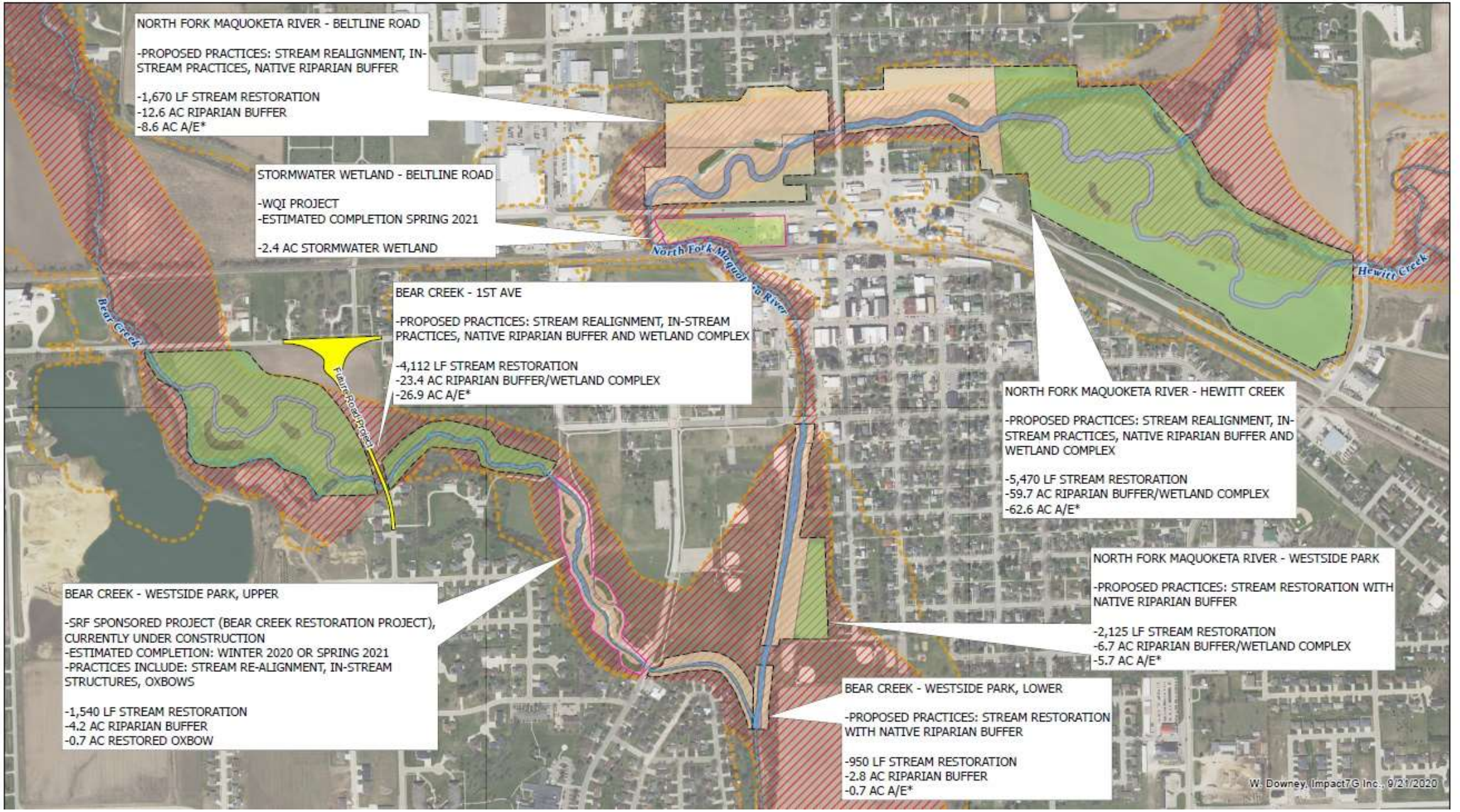





Japanese-knotweed
removed
Oxbow
Inner-berm
Rip-rap
removed



Dyersville – Next up?


NORTH FORK MAQUOKETA RIVER - BELTLINE ROAD
-PROPOSED PRACTICES: STREAM REALIGNMENT, IN-STREAM PRACTICES, NATIVE RIPARIAN BUFFER
-1,670 LF STREAM RESTORATION
-12.6 AC RIPARIAN BUFFER
-8.6 AC A/E*
STORMWATER WETLAND - BELTLINE ROAD
-WQI PROJECT
-ESTIMATED COMPLETION SPRING 2021
-2.4 AC STORMWATER WETLAND
BEAR CREEK - 1ST AVE
-PROPOSED PRACTICES: STREAM REALIGNMENT, IN-STREAM PRACTICES, NATIVE RIPARIAN BUFFER AND WETLAND COMPLEX
-4,112 LF STREAM RESTORATION
-23.4 AC RIPARIAN BUFFER/WETLAND COMPLEX
-26.9 AC A/E*
NORTH FORK MAQUOKETA RIVER - HEWITT CREEK
-PROPOSED PRACTICES: STREAM REALIGNMENT, IN-STREAM PRACTICES, NATIVE RIPARIAN BUFFER AND WETLAND COMPLEX
-5,470 LF STREAM RESTORATION
-59.7 AC RIPARIAN BUFFER/WETLAND COMPLEX
-62.6 AC A/E*
NORTH FORK MAQUOKETA RIVER - WESTSIDE PARK
-PROPOSED PRACTICES: STREAM RESTORATION WITH NATIVE RIPARIAN BUFFER
-2,125 LF STREAM RESTORATION
-6.7 AC RIPARIAN BUFFER/WETLAND COMPLEX
-5.7 AC A/E*
BEAR CREEK - WESTSIDE PARK, UPPER
-SRF SPONSORED PROJECT (BEAR CREEK RESTORATION PROJECT), CURRENTLY UNDER CONSTRUCTION
-ESTIMATED COMPLETION: WINTER 2020 OR SPRING 2021
-PRACTICES INCLUDE: STREAM RE-ALIGNMENT, IN-STREAM STRUCTURES, OXBOWS
-1,540 LF STREAM RESTORATION
-4.2 AC RIPARIAN BUFFER
-0.7 AC RESTORED OXBOW
BEAR CREEK - WESTSIDE PARK, LOWER
-PROPOSED PRACTICES: STREAM RESTORATION WITH NATIVE RIPARIAN BUFFER
-950 LF STREAM RESTORATION
-2.8 AC RIPARIAN BUFFER
-0.7 AC A/E*
Bear Creek
Future Road Project
North Fork Maquoketa River
Hewitt Creek
W. Downey, Impact7G Inc., 9/21/2020

Dyersville Downtown Driftless Float Park

One-of-a-kind, family-friendly outdoor recreation experience. The proposal is to create a lazy river float park, through stream restoration measures

If you CLEAN it, they will Come!

Every community has a little **Stream** running through it

IMPACT7G

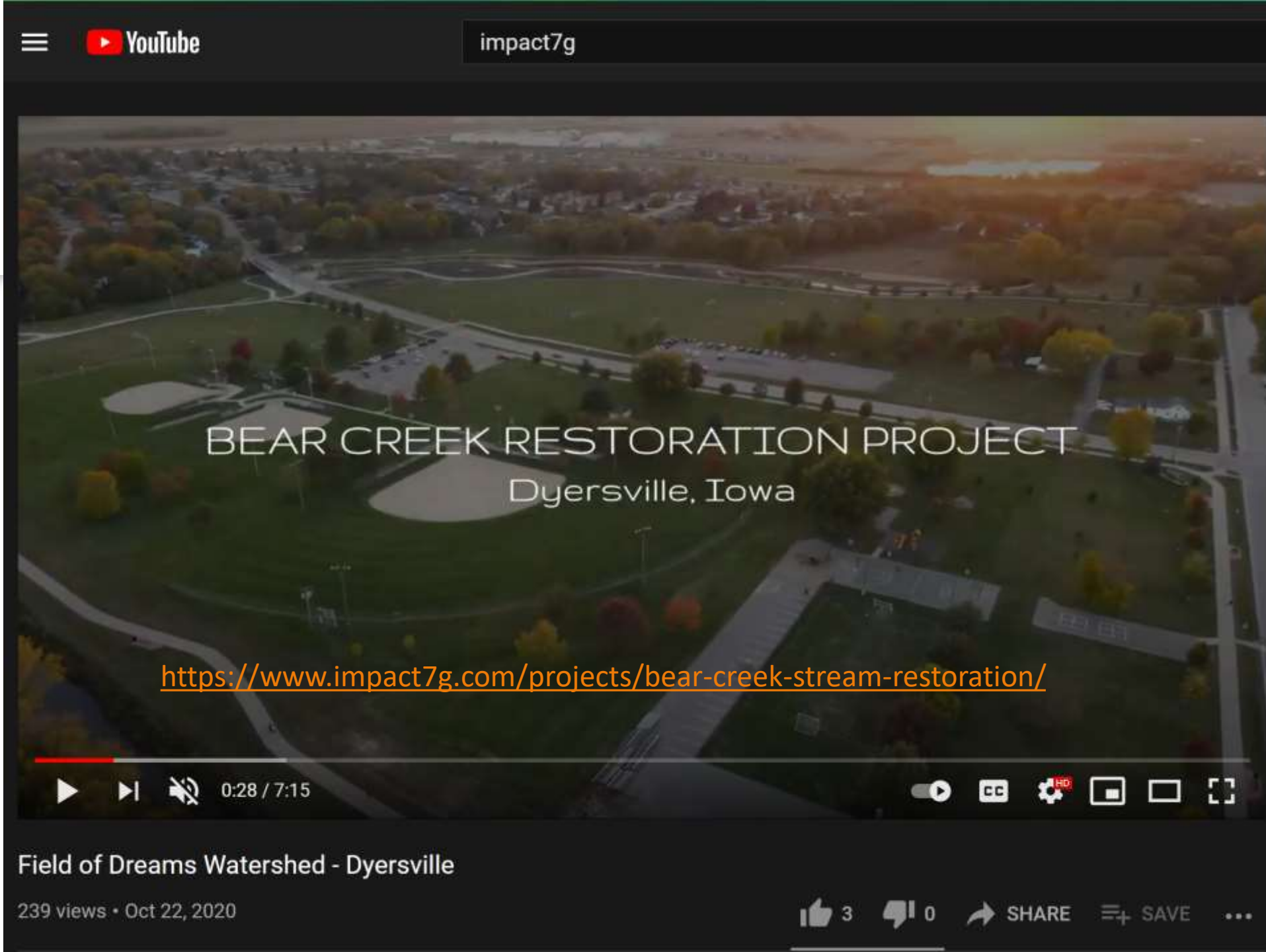

Economic Drivers
+
Assessment Methods
+
Funding Source
+
Connect to BIG
=
Prioritizing Clean Water

For More Information

Impact7G.com

Live webcam

YouTube Video



Contact Us:
Judy Joyce: jjoyce@impact7g.com
Reid Stamer: rstamer@impact7g.com

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Sustainable Environmental Solutions