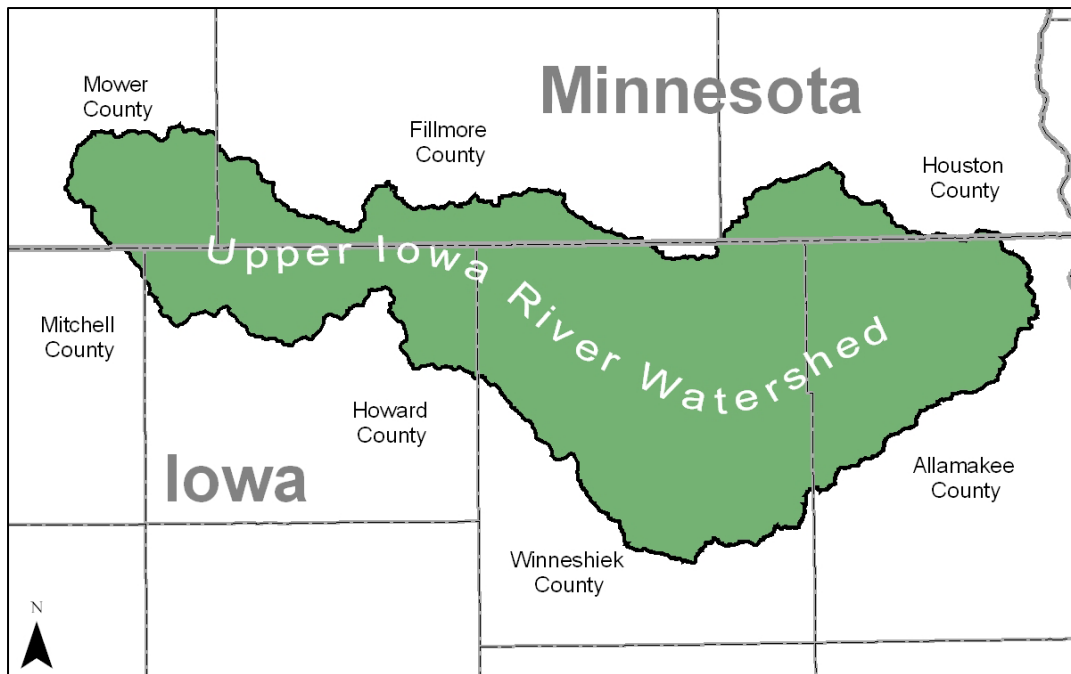


# Upper Iowa River Watershed GIS Analysis



Adam Kiel  
GIS Specialist  
Upper Iowa River Watershed Project  
Northeast Iowa RC&D  
adamkiel@netins.net

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# Location Characteristics of the Upper Iowa River Watershed

**Total Watershed Size:** 640,901 Acres or 1,001 square miles.

**UIRW: Divided into 35 sub-watersheds**

**Largest Sub-watershed:** Canoe Creek Sub-Watershed (42,391.2 acres)

**Smallest Sub-watershed:** Decorah's Dry Run (969.2 acres)

## Location Analysis of the UIRW

<u>County</u>	<u>State</u>	<u>Acres of UIRW in County</u>	<u>% of Watershed in County</u>	<u>% of County in Watershed</u>
Allamakee	Iowa	130,838.0	20.4%	31.00%
Howard	Iowa	90,360.0	14.1%	29.80%
Winneshiek	Iowa	279,661.5	43.6%	63.30%
Mitchell	Iowa	952.6	0.1%	0.02%
Mower	Minnesota	51,061.4	8.0%	11.20%
Fillmore	Minnesota	59,228.0	9.2%	10.70%
Houston	Minnesota	28,799.5	4.5%	7.90%

<u>State Breakdown</u>	<u>Acres</u>	<u>% of Watershed in State</u>	<u>% of State in Watershed</u>
Minnesota	139,089	21.7%	0.26%
Iowa	501,812	78.3%	1.39%

# Land Cover Characteristics of the Upper Iowa River Watershed

## Detailed Land Cover

<u>Land Cover</u>	<u>Acres</u>	<u>% of Watershed</u>
Corn	142067.2	22.2%
Soybeans	122837.9	19.2%
Deciduous Forest	108362.7	16.9%
Ungrazed Grassland	83778.9	13.1%
Alfalfa	59402.7	9.3%
Grazed Grassland	57197.6	8.9%
CRP Grassland	25261.0	3.9%
Coniferous Forest	13145.1	2.1%
Roads	12299.8	1.9%
Residential	5774.4	0.9%
Wetland	2908.5	0.5%
Commercial Industrial	2878.4	0.4%
Water	1929.6	0.3%
Other Rowcrop	1373.1	0.2%
Bottomland Forest	1129.0	0.2%
Barren	545.9	0.1%
Unclassified	6.4	0.0%
Clouds / Shadow / No Data	3.1	0.0%

## Generalized Land Cover

<u>Landcover</u>	<u>Acres</u>	<u>% of Watershed</u>
Cropland (Row Crops)	266278.2	41.5%
Grassland/Pasture/CRP	225640.1	35.2%
Forest	122636.9	19.1%
Residential/Commercial	20952.7	3.3%
Water/Wetland	4838.1	0.8%
Other	555.4	0.1%

## UIRW Historic Land Cover

*Source: The Government Land Office (GLO) conducted the original public land survey of Iowa during the period 1832 to 1859*

<u>Land Cover</u>	<u>Acres</u>	<u>% of Watershed</u>
Prairie	247,252	38.6%
Woodland	390,471	60.9%
Unknown	3,099	0.5%

# **River & Stream Characteristics of the Upper Iowa River Watershed**

## **River & Stream Classifications (Iowa DNR)**

**A (Human contact): 109.4 miles**

**BCW (Cold water resource): 152.2 miles**

**BLR (Limited resource for warm water aquatic life): 23.8 miles**

**BWW (Significant resource for warm water aquatic life): 159.2 miles**

**HQ (High Quality): 60.6 miles**

**HQR (High Quality Resource): 183.9 miles**

## **Stream Order Classifications**

1<sup>st</sup> Order Streams: 841 miles

2<sup>nd</sup> Order Streams: 295 miles

3<sup>rd</sup> Order Streams: 139 miles

4<sup>th</sup> Order Streams: 130 miles

5<sup>th</sup> Order Streams: 14 miles

Total Stream Distances in the UIRW: 1,419 miles

*Source: Strahler Stream Order of Streams in Iowa*

# **Karst Characteristics of the Upper Iowa River Watershed**

## **Karst Features**

According to Iowa Geologic Survey Bureau and karst information provided by the State of Minnesota there are **2,596 sinkholes in the Upper Iowa River Watershed**. Given the unpredictable formation patterns of sinkholes, previously unknown sinkholes could appear at any time, therefore assigning an absolute number of sinkholes is not viable.

Disappearing Streams: 68 locations in the UIRW

## **Detailed Karst Mapping of the UIRW**

A 24 square mile study area was selected to conduct a karst inventory. In that study area the following features were found, documented, and mapped.

**Sinkholes: 281**

**Springs: 31**

**Disappearing Streams: 3**

## Soil Characteristics of the Upper Iowa River Watershed- STATSGO

Soil Name	Acres	%
FAYETTE	185374.40	28.9%
DOWNS	106511.05	16.6%
SEATON	58047.09	9.1%
LACRESCENT	49020.34	7.6%
ROCKTON	45095.70	7.0%
CLYDE	41785.12	6.5%
KENYON	32902.87	5.1%
BASSETT	26027.05	4.1%
TRIPOLI	21827.62	3.4%
DORCHESTER	21268.30	3.3%
SPILLVILLE	13717.83	2.1%
MT. CARROLL	11096.34	1.7%
TAMA	9662.84	1.5%
ROSSFIELD	8864.76	1.4%
MARSHAN	7825.38	1.2%
CHELSEA	1874.29	0.3%

# Soil Loss Characteristics of the Upper Iowa River Watershed

## RULSE Soil Loss in the UIRW

<b>Rank</b>	<b>Subwatershed</b>	<b>Mean Soil Loss (tons/acre/yr)</b>
1	Trout Run	14.7099
2	Trout River	13.0143
3	Casey Spring Creek	12.2006
4	Pine Creek West	10.375
5	Dry Run Creek	10.1387
6	Coldwater Creek	9.89634
7	Tenmile Creek	9.3437
8	South Bear Creek	9.10029
9	Canoe Creek	8.9528
10	Clear Creek	8.37584
11	North Bear Creek	7.87253
12	Bear Creek	7.79545
13	Waterloo Creek	7.63301
14	Coon Creek	7.51102
15	French Creek	7.38445
16	Upper Iowa River 2	7.15114
17	Pine Creek E	6.89218
18	Patterson Creek	6.76238
19	Bigalk Creek	6.39036
20	Silver Creek East	6.0507
21	Upper Iowa River 7	6.01098
22	Silver Creek W	5.5086
23	Beaver Creek IA	4.33226
24	Staff Creek	4.10969
25	Decorah Dry Run	3.39783



## Subwatershed Characteristics of the Upper Iowa River Watershed

### UIRW Subwatershed Size

<u>Name</u>	<u>Acres</u>	<u>Sq Miles</u>
Bear Creek	10165.2	15.9
Beaver Creek IA	16960.3	26.5
Beaver Creek MN	17027.2	26.6
Bigalk Creek	11498.3	18.0
Canoe Creek	42391.2	66.2
Casey Spring Creek	7923.2	12.4
Clear Creek	9645.9	15.1
Coldwater Creek	16097.4	25.2
Coon Creek	12537.2	19.6
Decorah Dry Run	969.3	1.5
Dry Run Creek	20171.8	31.5
French Creek	14979.1	23.4
Irish Hollow Creek	5555.3	8.7
Little Iowa River	17554.9	27.4
Martha Creek	4633.5	7.2
Mineral Creek	5200.3	8.1
N Branch Upper Iowa	20093.4	31.4
No Name	2190.3	3.4
No Name #2	2160.9	3.4
North Bear Creek	20521.5	32.1
Patterson Creek	10188.1	15.9
Pine Creek E	7205.5	11.3
Pine Creek West	22976.7	35.9
Silver Creek	5541.7	8.7
Silver Creek East	13712.9	21.4
Silver Creek West (Cresco)	22410.8	35.0
South Bear Creek	12989.5	20.3
Staff Creek	13018.1	20.3
Tenmile Creek	20229.7	31.6
Trout River	25872.1	40.4
Trout Run	32636.3	51.0
Unnamed Creek MN	8411.4	13.1
Upper Iowa River Corridor 2	101271.0	158.2
Upper Iowa River Corridor 7	55434.4	86.6
Waterloo Creek	30905.2	48.3

## **Agricultural Characteristics of the Upper Iowa River Watershed**

**Number of Farms:** 1,924 (estimated)  
**Lands in Farms (acres):** 535,395 (estimated)  
**Average farmland value (per acre):** \$1,794.9 (estimated)

**Number of Cattle & Calves:** 97,357 (estimated)  
**Hogs:** 180,087 (estimated)  
**Sheep & Lambs:** 3168 (estimated)

*Source: National Agriculture Statistics Service (NASS) 2002*

# **Climatic Characteristics of the Upper Iowa River Watershed**

## **Temperature**

Annual mean temperature of **46.7°** F in Decorah.  
All-Time extreme High of **104°** F, extreme low of **-43°** F.

## **Precipitation**

**33.4**" of precipitation per year average.  
**39.8**" of snow per year average.  
Average # of days with >1.0" of precipitation: **7.3**  
Average # of days with >0.5" of precipitation: **21.9**  
Average # of days with >0.1" of precipitation: **65.6**

## **Growing Season**

Average growing season (temps above 32° F) is **152 days**.

*Source: The Midwestern Regional Climate Center*

## **Elevation & Slope Characteristics of the Upper Iowa River Watershed**

### **Elevation:**

High Elevation of Watershed: 1,438 feet above sea level

Low Elevation of Watershed: 612 feet above sea level

Elevation Range: 826 feet

Mean Elevation: 1,157 feet above sea level

### **Slope:**

High Slope Percentage: 104%

Low Slope Percentage: 0%

Mean Slope of Land: 8.4%

### **Upper Iowa River Details:**

Upper Iowa River Headwater Elevation at Lake Louise: 1261 ft above sea level

Upper Iowa River Mouth Elevation at Mississippi River: 612 ft above sea level

Drop from Headwaters to Mouth: 649 feet

Upper Iowa River Distance from Headwaters to Mouth: 133.6 Miles (EST.)

Average drop per mile: 4.85 feet

## Deforestation in the UIRW

*Historical Land Cover data and 2002 landcover was used to conduct analysis*

<i>Rank by Acres Lost</i>	<i>Name</i>	<i>Historical Forest Acres</i>	<i>Current Forest Acres</i>	<i>Forest Acres Lost</i>	<i>% Lost</i>
1	Upper Iowa River Corridor West	57633	15595	42038.0	72.9%
2	Canoe Creek	36853	10106	26747.0	72.6%
3	Upper Iowa River Corridor East	48516	24966	23550.0	48.5%
4	Trout Run	26024	4020	22004.0	84.6%
5	Pine Creek West	19453	1914	17539.0	90.2%
6	Waterloo Creek	23127	7867	15260.0	66.0%
7	Coldwater Creek	15788	1544	14244.0	90.2%
8	Trout River	17598	4200	13398.0	76.1%
9	North Bear Creek	13859	4437	9422.0	68.0%
10	Silver Creek East (Waukon)	13244	5736	7508.0	56.7%
11	French Creek	12953	5483	7470.0	57.7%
12	Coon Creek	9466	2885	6581.0	69.5%
13	Patterson Creek	10048	3878	6170.0	61.4%
14	Bear Creek	9891	4568	5323.0	53.8%
15	South Bear Creek	8149	3173	4976.0	61.1%
16	Clear Creek	9016	4045	4971.0	55.1%
17	Beaver Creek MN	5327	698	4629.0	86.9%
18	Silver Creek (Burr Oak)	5017	760	4257.0	84.9%
19	North Branch	3809	245	3564.0	93.6%
20	Bigalk Creek	4183	714	3469.0	82.9%
21	Mineral Creek	5187	1850	3337.0	64.3%
22	Pine Creek East	5570	2819	2751.0	49.4%
23	Silver Creek West (Cresco)	3361	1112	2249.0	66.9%
24	Irish Hollow Creek	4902	2868	2034.0	41.5%
25	Dry Run Creek	3775	1781	1994.0	52.8%
26	Little Iowa	2157	333	1824.0	84.6%
27	Tenmile Creek	2887	2196	691.0	23.9%
28	Casey Spring Creek	1830	1199	631.0	34.5%
29	Beaver Creek IA	740	226	514.0	69.5%
30	Decorah Dry Run	614	171	443.0	72.1%
31	Martha Creek	491	301	190.0	38.7%
32	Staff Creek	452	273	179.0	39.6%

## **Census Characteristics of the Upper Iowa River Watershed**

Total Population in Watershed: 27,329 (2000 Census)  
12,203 people live outside an incorporated city or town (44.6%)

Families: 6,807 (2000 Census)

Household Units: 10,910 (2000 Census)  
4,311 households outside an incorporated city or town (39.5%)

Incorporated Places in UIRW: 12

Chester  
Lime Springs  
Cresco  
Decorah  
Ridgeway  
Calmar  
Harmony  
Spring Grove  
Taopi  
Canton  
Le Roy  
Eitzen

*Source: 2000 Census Block Data*

# **Transportation Characteristics of the Upper Iowa River Watershed**

## **Transportation Infrastructure in the UIRW**

Allamakee Road Mileage in Watershed: 326 Miles  
Winneshiek Road Mileage in Watershed: 803  
Howard Road Mileage in Watershed: 284  
Mower Road Mileage in Watershed: 189  
Fillmore Road Mileage in Watershed: 122  
Houston Road Mileage in Watershed: 220

Total in Watershed: 1,944 miles

## **Intersections of Streams/Rivers and Roads in the UIRW**

Number of Intersections of Roads and Streams and Rivers in the UIRW: 1,233  
4 Intersections with 5<sup>th</sup> order streams  
60 Intersections with 4<sup>th</sup> order streams  
104 Intersections with 3<sup>rd</sup> order streams  
273 Intersections with 2<sup>nd</sup> order streams  
792 Intersections with 1<sup>st</sup> order streams

## **Intersections of Railroads and Roads in the UIRW**

o in the UIRW

*Source: Transportation data from Iowa DOT and Minnesota DOT*

## **Underground Storage Tank Sites in the Upper Iowa River Watershed (Iowa Only)**

Underground storage tank (UST) sites which store petroleum in Iowa. Includes sites which have been reported to DNR, and have active or removed underground storage tanks. This coverage includes 97% of the UST sites. Of the remaining 3%, most are unregulated sites. Efforts to complete the coverage are ongoing

### **87 Sites**

Breakdown:

- 1 Non-regulated Farm/Res
- 55 Regulated tanks - removed/filled
- 31 Regulated tanks – active

## **Leaking Underground Storage Tank Sites in Iowa**

Leaking Underground Storage Tank (LUST) sites where petroleum contamination has been found.

### **38 Sites**

Breakdown:

- 9 – High Risk
- 3 - Low Risk
- 22 – No Action Required
- 4 - Not Classified

*Source: Leaking Underground Storage Tank Sites in Iowa*



# **Wastewater Treatment Facilities in the Upper Iowa River Watershed**

## **Iowa:**

- 10** Municipal Treatment Plants (Iowa Only)
- 21** Industrial Wastewater treatment Facilities (Iowa Only)
- 4** Semi-Public Wastewater treatment facilities (Iowa Only)

## **Minnesota:**

Unknown

*Source: Wastewater Treatment Plants of Iowa*

# Quarry Sites in the Upper Iowa River Watershed

## UIRW Quarry Facts (Iowa Only)

**67** Quarries in the Iowa portion of the Upper Iowa River Watershed.  
All are surface operations

Of the 67; **13 are closed, 50 are open, and 3 have a release request.**

Products Mined: (Quarries can mine for multiple products)

**17** mine for aglime

**53** mine for limestone or dolomite

**17** mine for sand

**8** mine for gravel

*Source: Non-Coal Mineral Production Mines in Iowa, 2000*

## Municipal Drinking Water Sources in the Upper Iowa River Watershed

14 Municipal well in the Iowa portion of the UIRW

<b>Municipality:</b>	<b>Depth (ft):</b>
Cresco	1145
Lime Springs	358, 380
Calmar	700
Freeport	505
Decorah	65, 67, 60, 72, 72, 82, 72
Ridgeway	192, 592

*Source: Municipal Water Intakes of Iowa*

# **Species of Concern in the Upper Iowa River Watershed**

## **Threatened, Endangered or Special Concern Species in the UIRW (Iowa Only)**

There have been 204 documented occurrences of threatened and endangered species and natural communities in the Upper Iowa River Watershed (Iowa Portion Only).

Breakdown:  
11 Vertebrates  
53 Invertebrates  
91 Plants  
49 Communities

The lack of occurrence records in a specific area does not imply the absence of natural communities or threatened or endangered species. The coverage contains reported occurrences only and does not represent data from any type of state-wide survey for the presence of threatened and endangered species. If a more detailed review is required for a specific area, contact John Pearson.

*Source: Threatened and Endangered Species Section Locations in Iowa*