



## **MidMichigan Environmental Action Council**

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### **Final Project Report to Great Lakes Commission, MDEQ/MiCorps**

### **Re: Red Cedar River Watershed Volunteer Stream Monitoring Project**

### **Grantee: MidMichigan Environmental Action Council (MidMEAC)**

#### **Project Goals and Objectives.**

##### Goals:

- 1) Educate Mid-Michigan residents on the value of Stream Monitoring and its role in protecting water quality
- 2) Engage volunteers in hands-on monitoring activities
- 3) Conduct Stream Monitoring at ten or more sites in the Red Cedar Watershed
- 4) Obtain data to be used in watershed planning and projects to address water quality degradation.

##### Objectives:

##### Project Preparation

Review study plan and site locations.

Inventory existing sampling equipment (waders, nets); obtain additional equipment as needed (sample jars, alcohol to preserve specimens, etc.)

Program Manager and Volunteer Team Leaders attend MiCorps training

Conduct training event for remaining volunteers.

Prepare and submit Quality Assurance Project Plan.

##### Sampling Events

Conduct sampling event with MiCorps (Quality Control)

Collect samples and habitat information in the spring and fall of each year

Sort, record/report data, and store samples

##### Data Management

Analyze data using MiCorps preferred methods

Enter data into the MiCorps Data Exchange network

Share data with public and interested agencies via Mid-MEAC website

##### Outreach & Education

Recruit volunteers through news articles, facebook, website, at public meetings, and through Michigan State University professors with students in relevant courses.

Report findings through media, social media, Mid-MEAC's website, and at meetings.

Attend MiCorps Annual Conference and give presentation at 2017 conference



## **MidMichigan Environmental Action Council**

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#### **Goals and Objectives – Narrative**

1) Educate area residents on the value of Stream Monitoring and its role in protecting water quality. MidMEAC Director/Project Manager education and outreach activities included:

- Volunteer recruiting via newsletter, social media, and personal contacts.
- Contacted MSU-ANR faculty coordinating Fisheries/Wildlife Club and Sustainability; recruited 3-5 volunteers per fall event. Some carryover (1-2 volunteers) for spring event. Reduction results from timing; MSU classes end in May, while MidMEAC's spring sampling event is in early June.
- Contacted professionals in water science and water infrastructure engineering; recruited Program Leader and two Team Leaders.
- Discussed program goals and results with attendees at various workshops, conferences, and meetings, i.e., MiCorps Annual Conference 2017, Quiet Water Symposium 2016/2017/2018, service club presentations.
- Created new website with page for Stream Monitoring, including ESRI Story Map.
- Entered data into online database, making it available to others.
- Responded to press and private queries re: Red Cedar River watershed water quality measures.

2) Engage volunteers in hands-on monitoring activities

- Recruited volunteers as described above, numbering 10 – 16 volunteers per monitoring event.
- Organized macroinvertebrate sampling training sessions; training leader from 2015 transitioned duties to new training leader (David Christian, P.E.)
- Reviewed MiCorps documents with volunteers before sampling (MiCorps site sketch and datasheet.)
- Organized sample identification sessions. Recruit expert volunteers from MSU and private industry to train volunteers and to consult on difficult identifications.

3) Conduct Stream Monitoring at ten or more sites in the Red Cedar Watershed

- Reviewed locations, mapped and calculated mileage. Created work-plan with emphasis on assigning sites for team efficiency.
- Reviewed Quality Assurance Project Plan and identified areas needing revision. Most are predictable updates like names of project organizers, number of sites, and timetables.
- MidMEAC volunteers sampled 12 sites within the Red Cedar Watershed in June 2016, October 2016, June 2017, October 2017, and June 2018.
  - o Corwin Road Tributary
  - o West Branch Red Cedar River (Coon Lake Road)
  - o Kalamink Creek (Van Orden Road)
  - o Sycamore Creek
  - o Red Cedar River (Dobie Road)
  - o Wolf Creek @ Bell Oak Road
  - o Red Cedar River @ Montgomery Drain Upstream
  - o Red Cedar River @ Montgomery Drain Downstream
  - o Red Cedar River @ Ferguson Park / Okemos Road
  - o Layton Road Bridge (the only Livingston County site on our list)
  - o Bauer Drain Upstream of tank farm
  - o Bauer Drain Downstream of tank farm



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#### **Goals and Objectives – Narrative cont.**

4) Obtain data to be used in watershed planning and projects to address water quality degradation.

- Consulted with Ingham County Drain Commissioner's office to determine expansion priorities. After consultation, MidMEAC elected to add two sites along the Bauer Drain, upstream and downstream from a petroleum tank storage facility. The facility released more than 400,000 gallons of gasoline to the drain in 2011, which outlets to the Red Cedar River.
- Monitoring of the Montgomery Drain sites (upstream and downstream of the drain outlet) provided data to support the Drain Commissioner's decision to day-light portions of the drain near the outlet, creating a large-scale system of weirs, streams, rain gardens, constructed wetlands and ponds that will circulate and clean storm water before it outlets to the Red Cedar River.

#### **Environmental Benefits and Lessons Learned**

- MidMEAC shares data with governmental agencies and private entities in need of data that will help them make decisions to regarding local infrastructure (stormwater and wastewater), agricultural practices, and other land-use considerations.
- The Ingham County Drain Commissioner used MidMEAC data as part of the determination of need for a large-scale green stormwater infrastructure project to greatly reduce pollutants from the Montgomery Drain Drainage District to the Red Cedar River.
- MidMEAC's stream monitoring project overlaps with another MidMEAC initiative: Lake Investigations in Michigan and Nature Observations. We work with Project F.I.S.H., MSU Sailing Center, and local educators to bring school groups (grades 4 – 11) outdoors to explore lake chemistry testing, macroinvertebrate sampling, navigating (mathematics), fishing, nature journaling, and more.
- MidMEAC is committed to providing citizen-science opportunities in safe circumstances. The Council will discuss and continue to evaluate site selection. Criteria for selection will include accessibility, volunteer safety, and value of data.

#### **Considerations:**

- o Data MidMEAC collected upstream and downstream of the Montgomery Drain outlet contributed to the Ingham County Drain Commissioner's decision to re-engineer the drainage district. The Drain Commissioner's project will transform the enclosed drainage pipe into a Green Storm Water (GSW) infrastructure installation, with rain gardens, constructed streams, weirs, and ponds.

The Drain Commissioner's project is supported by a concurrent grant from the Michigan Department of Natural Resources to improve fisheries. Current project plans will deepen the adjacent section of the Red Cedar River and may affect safety factors for future sampling activities.

- o Dobie Road site requires key access to a secure site that hosts several communication towers and support facilities. Council should consider potential liability.
- o The Layton Road Bridge site presents significant physical challenges including steep rip-rap (large rock) banks, thick vegetation (including stinging nettles and poison ivy) and deep muck (approx. 3 feet deep.)
- o Several additional sites present physical challenges to volunteers, i.e., steep banks, rip-rap, overgrown vegetation, etc.





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### Project Partners and Contributions

Michigan State University – Ag. & Natural Resources; student volunteers

Lansing Community College – student volunteers

DC Engineering – professional volunteers

Spicer Group – professional volunteers

Tri Terra – professional volunteers

Ingham County Drain Commissioner's Office – site selection and permissions

Tri-county Regional Planning Commission / Greater Lansing Regional Committee for Stormwater, volunteers and promotional assistance

### Products

Newsletters

Web Postings

Story Map

Sample Record

### Project Sustainability

MidMEAC will continue stream-monitoring activities in the foreseeable future. The Board of Directors views this project as a "signature" activity for the Council. The team will exercise discretion over future site selection based on accessibility and physical safety of volunteers.



Sampling Montgomery Drain

Sycamore Creek

Corwin Road

Wolf Creek



Volunteer with  
kick-net

Examining leaf-pack

Pickers sort, collect and preserve macroinvertebrate samples.






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Training and assignments at Ferguson Park, Okemos

## MidMEAC Stream Monitoring Story Map

The construction of a Story Map that tells the story of MidMEAC's stream monitoring activities is among the major accomplishments made possible by this grant funding.

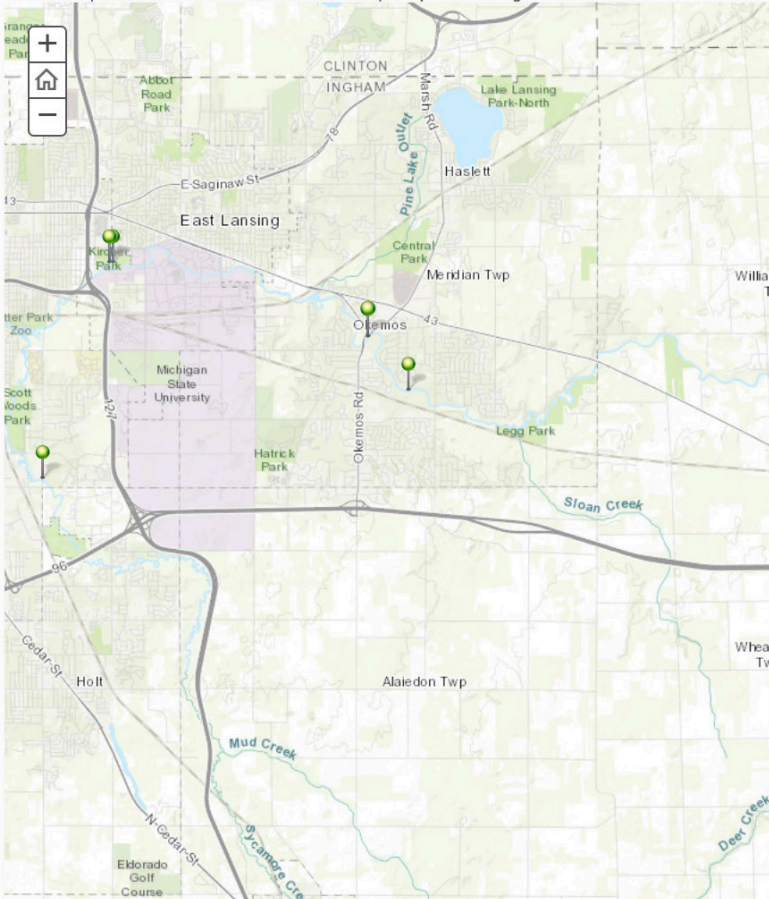


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## Stream Monitoring Map


Click on a pin to learn more about our water quality monitoring actions.



A Story Map | HAWASSEE | INGHAM



### Discover the Red Cedar



Training Stream Monitors on the Red Cedar River

Water quality reflects human activities and land uses along the Red Cedar vary from highly urbanized, intensely agriculture, and naturalized areas.

We are committed to improving our watershed through citizen stewardship.

Click on the map pins to see water quality data.

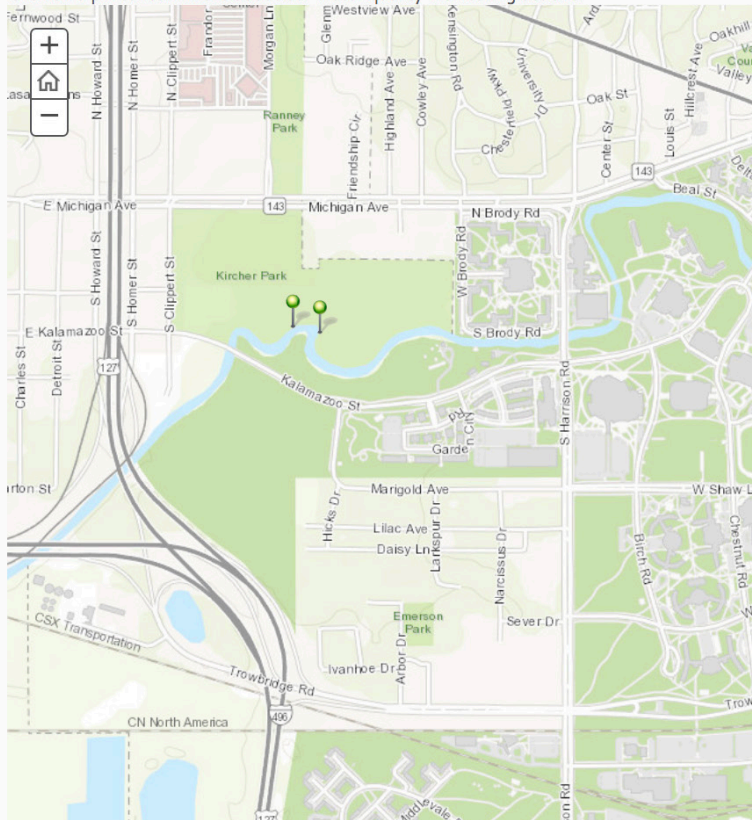




# MidMichigan Environmental Action Council

## Final Project Report to Great Lakes Commission, MDEQ/MiCorps

Click on a pin to learn more about our water quality monitoring actions.




A Story Map

Discover the Red Cedar

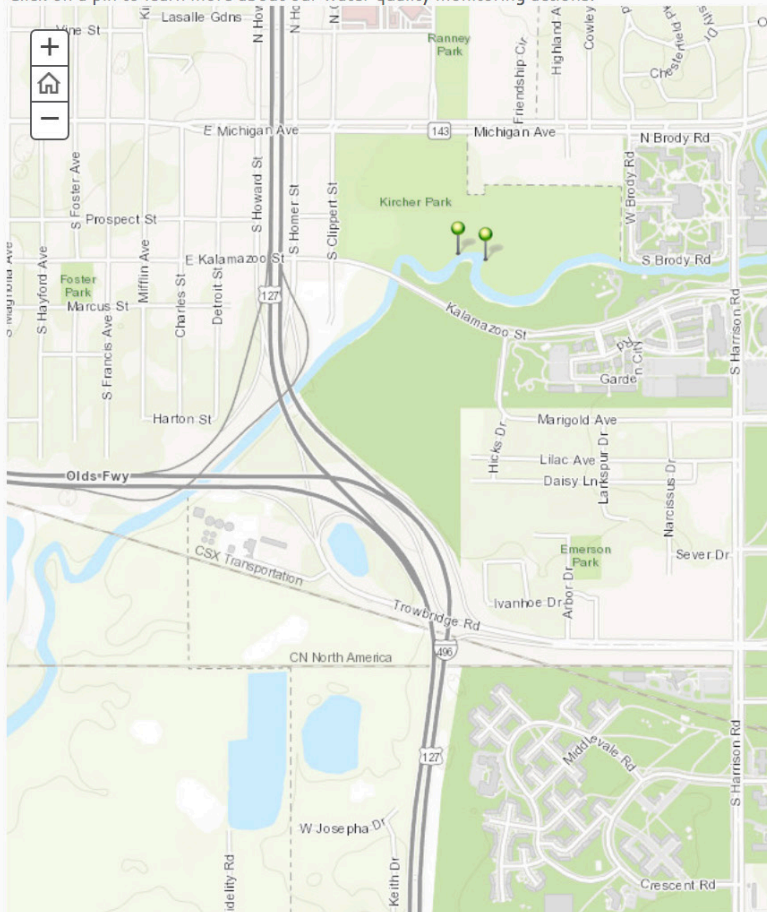
### Upstream of Montgomery Drain

The Montgomery Drain is among the most polluted outlets to the Red Cedar River. The Drain is a concrete pipe that carries stormwater along with heavy metals and other pollutants to the river. Mid-MEAC monitors upstream and downstream from the Montgomery Drain outlet.



Volunteers work on land to sort insects and their larvae from debris. Insects often make their homes in submerged woody material.

Click on a pin to learn more about our water quality monitoring actions.




A Story Map

Discover the Red Cedar

### Downstream of Montgomery Drain

Mid-MEAC is working with the Ingham County Drain Commissioner to engage residents in discussion of a plan to greatly reduce pollutant loading to the River. The Drain Commissioner is expected to replace the existing underground pipe with a Low Impact Design solution involving streams, ponds, constructed wetlands, and other features that mimic natural systems.



Macroinvertebrates gathered and preserved for identification.

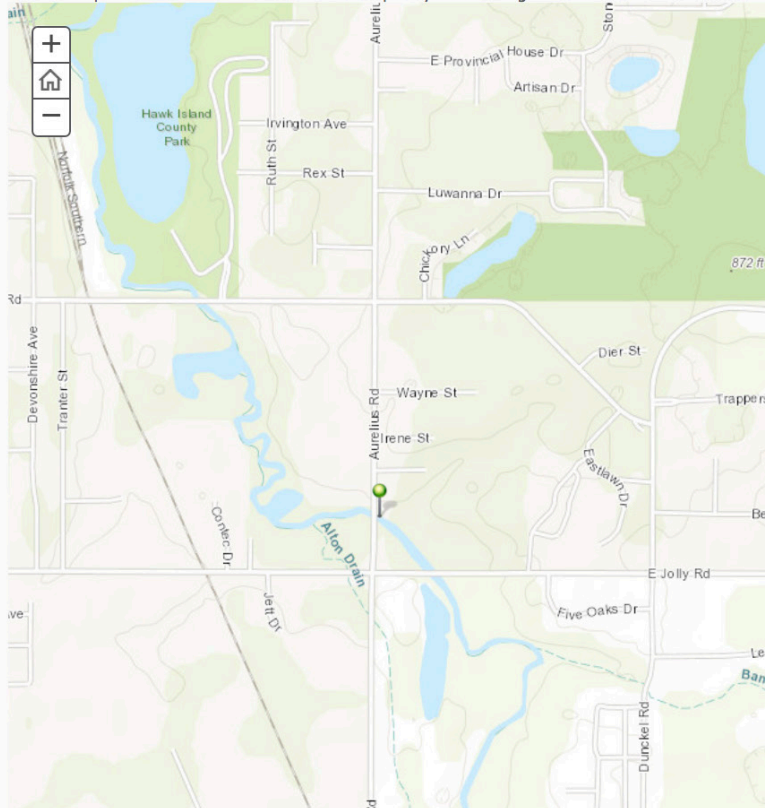








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A Story Map    

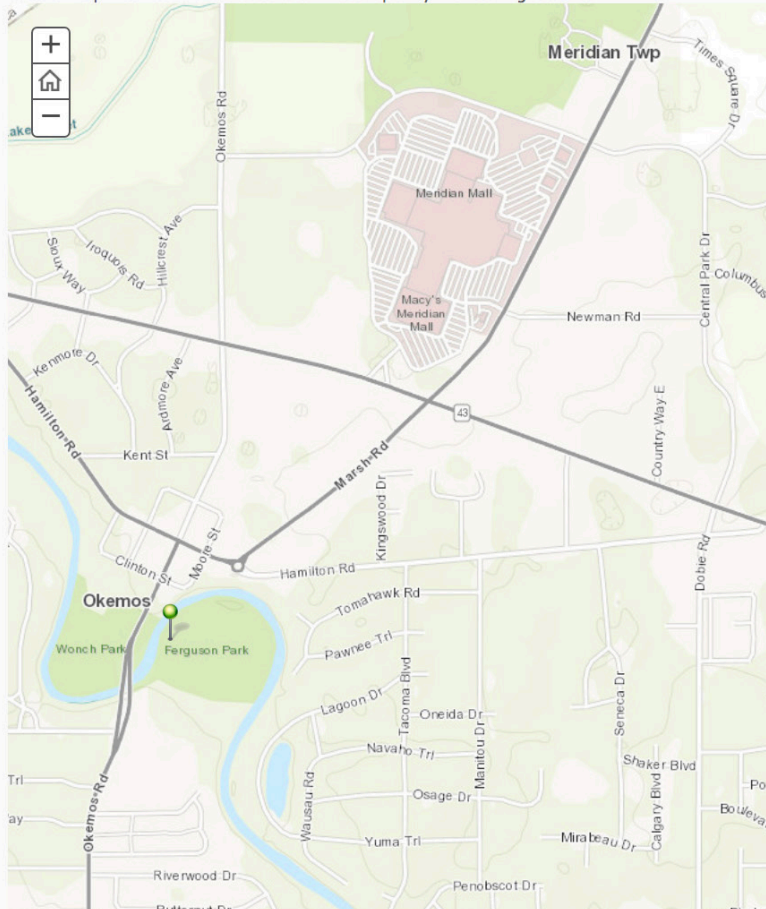
### Discover the Red Cedar





#### Sycamore Creek, Biggie Munn Park



Citizen Scientists help us collect water quality data

Click on a pin to learn more about our water quality monitoring actions.




A Story Map    

### Discover the Red Cedar

#### Red Cedar River at Ferguson Park

We are thankful for our volunteers. Mid-MEAC provides collection protocol training. Some of our 'citizen scientists' come back year after year, others move on and take our stewardship message with them. We are fortunate to have students from Michigan State University, Lansing Community College, and others work with us.

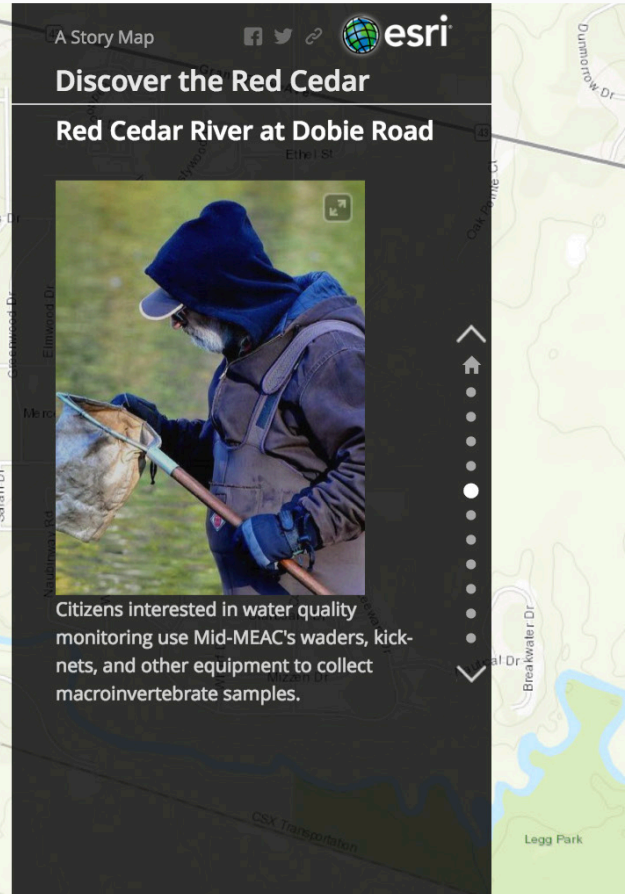
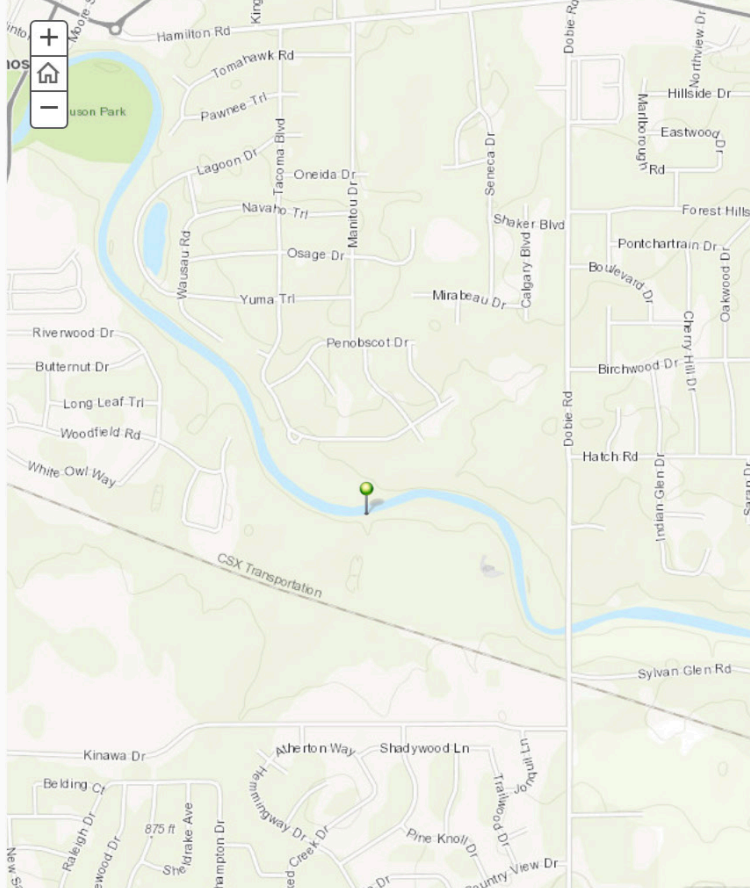




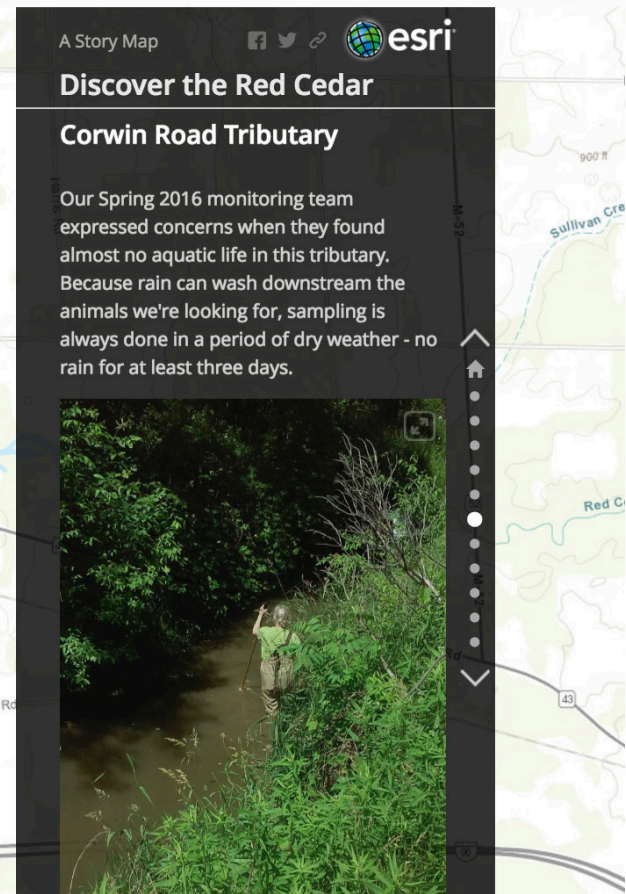
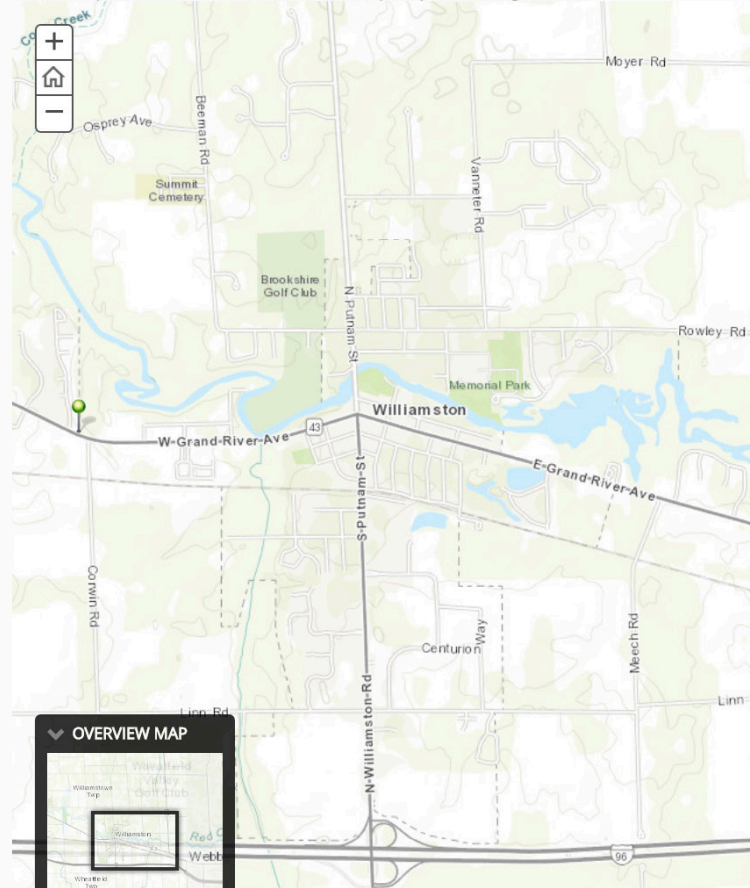


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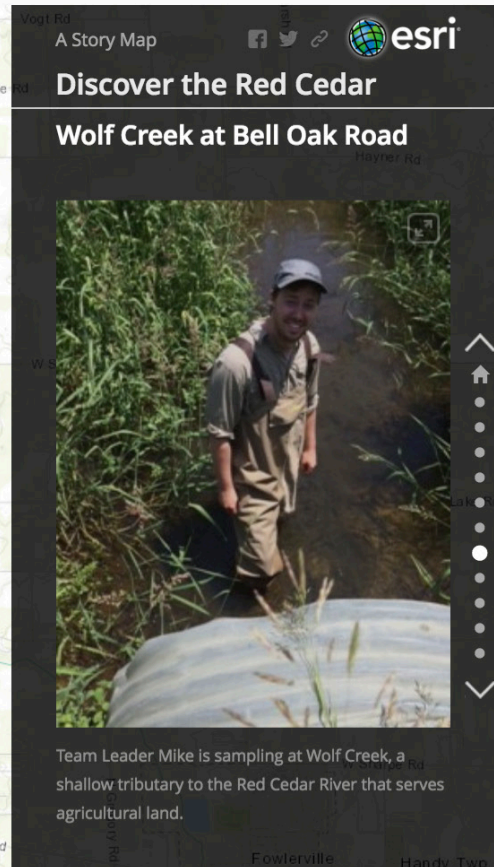
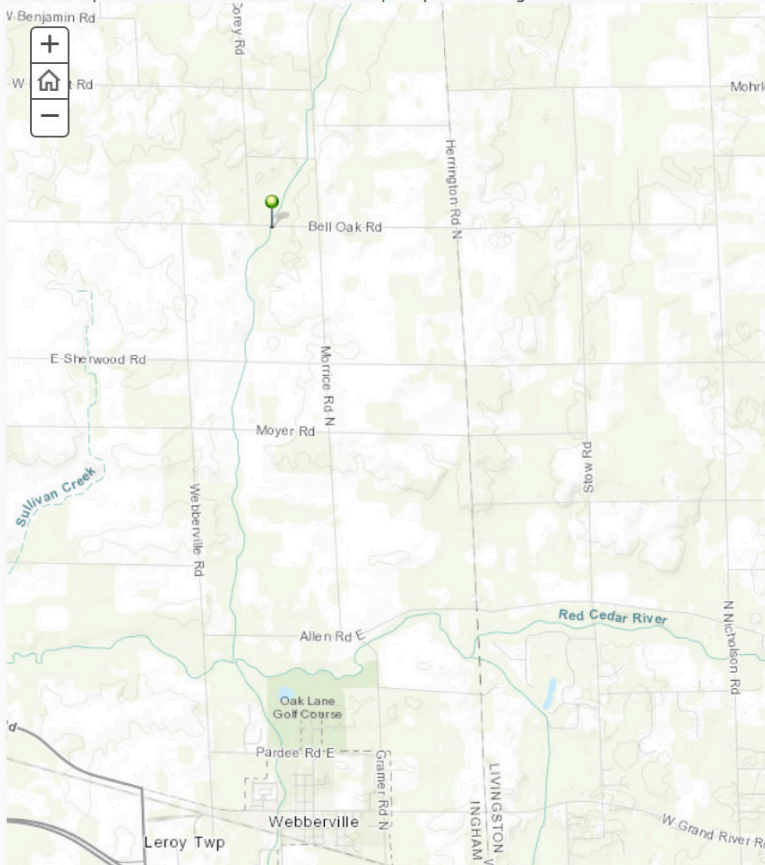




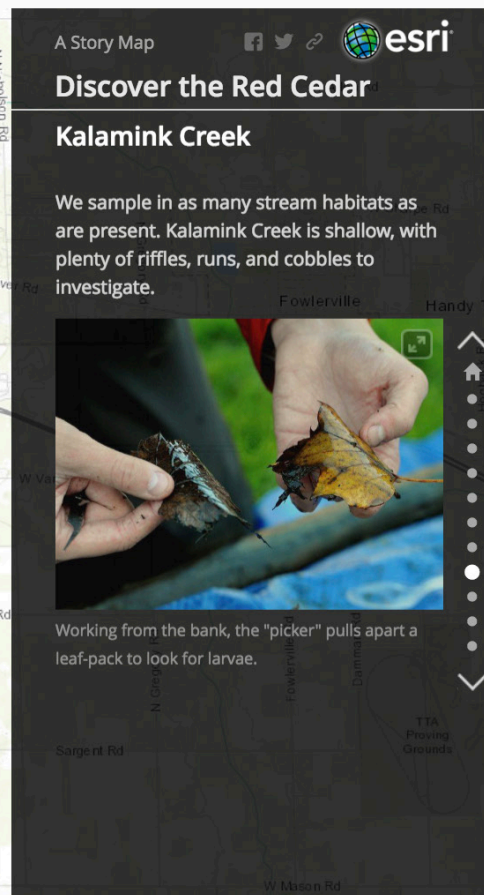
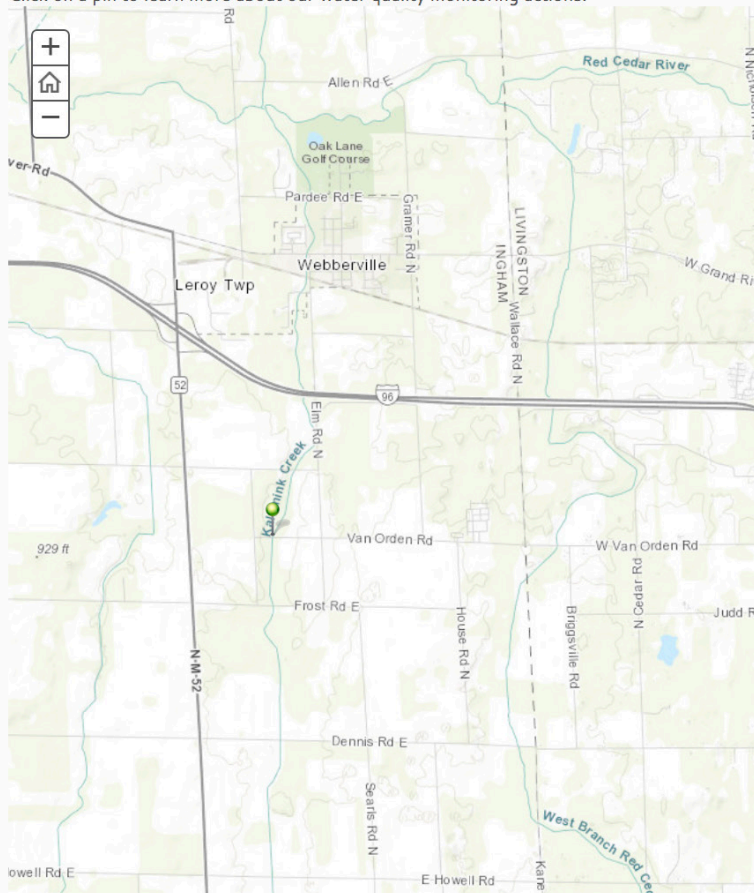
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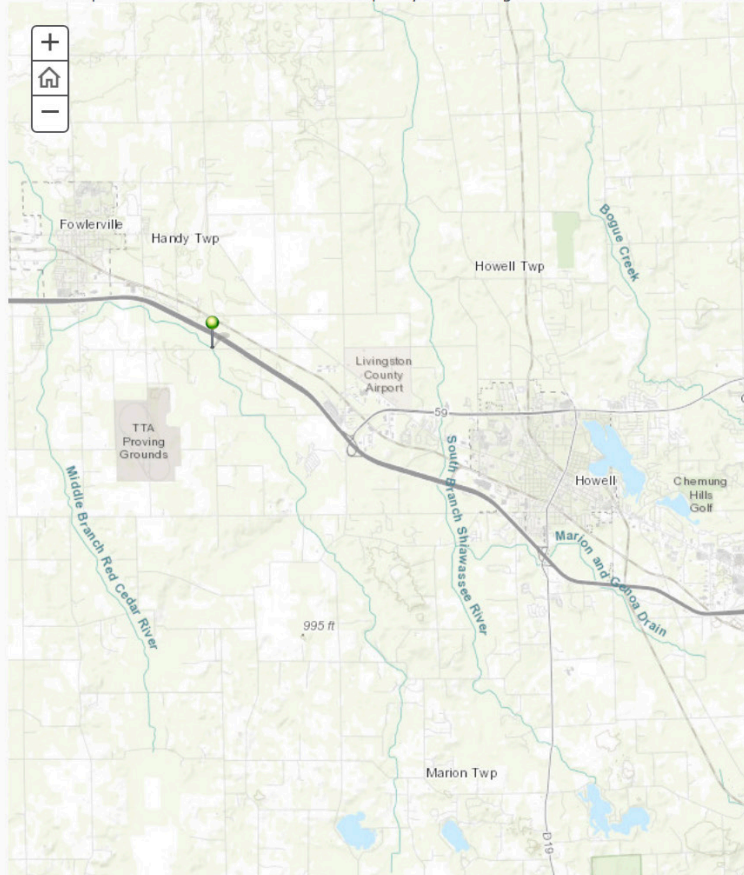










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Click on a pin to learn more about our water quality monitoring actions.




A Story Map    

## Discover the Red Cedar

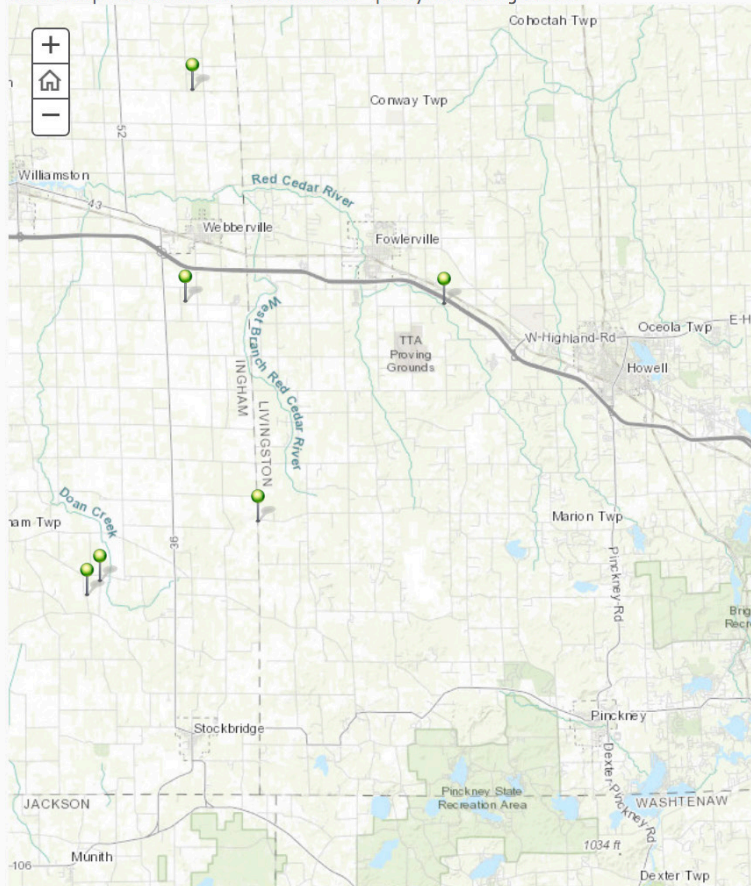
### Red Cedar River at Layton Road Bridge





The Red Cedar moves slowly here. The muck bottom is three feet thick, preventing in-stream sampling. Sampling from the bank wasn't easy, either, as we battled thick brush with plenty of poison ivy and stinging nettles. Layton Road Bridge is most definitely an "expert level" sampling site.



Poison Ivy... "leaves of three, let it be."

Click on a pin to learn more about our water quality monitoring actions.




A Story Map    

## Discover the Red Cedar

### West Branch of the Red Cedar River

Another site with thick vegetation along the banks.



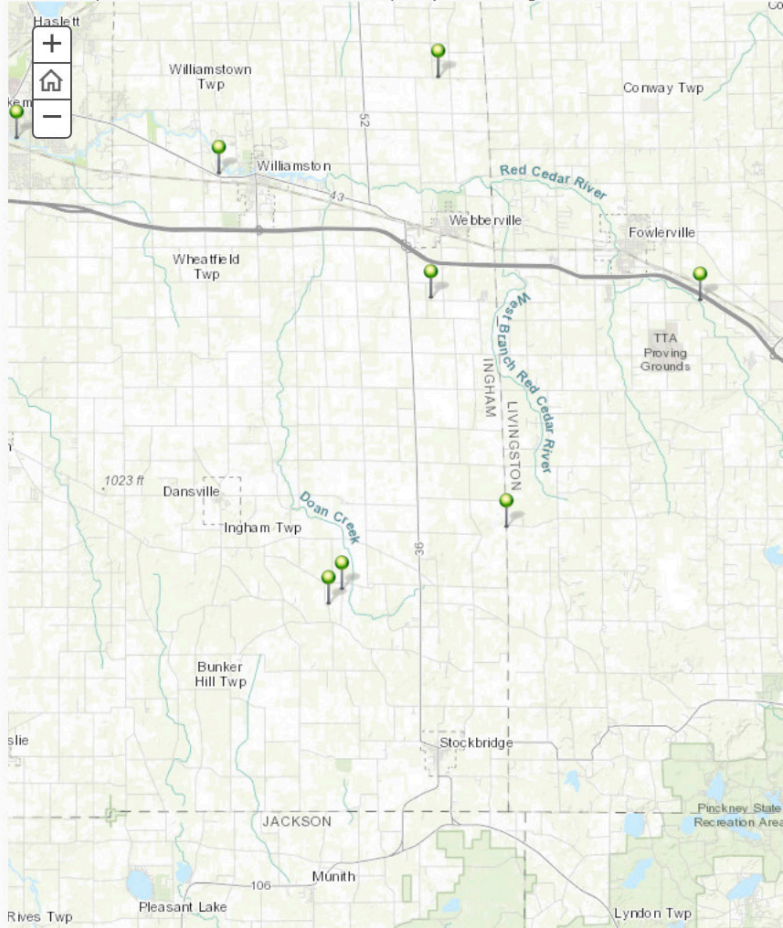
The "Picker" looks through leaf-packs, vegetation, and debris, sorting out larvae and adult insects, worms, clams, and snails. The animals are collected and preserved for identification.





## Stream Monitoring Map

Click on a pin to learn more about our water quality monitoring actions.



A Story Map

Discover the Red Cedar

### Bauer Drain

We sample two sites along the Bauer Drain. The first is upstream of a large petroleum tank farm, the second is downstream. We're looking for macroinvertebrate samples and measuring flow rates.

More than 300,000 gallons of gasoline leaked from this tank farm into the nearby Bauer Drain in 2011. The leak was reported by a neighboring landowner/farmer.

The map shows the Red Cedar River and the Bauer Drain. The map also shows the TTA Proving Grounds and the Kensington Metro park. The map is a story map, meaning it has a series of slides that tell a story about the Red Cedar River. The first slide is about the Bauer Drain. The second slide is about the petroleum tank farm. The third slide is about the leak of gasoline into the Bauer Drain. The fourth slide is about the monitoring of the Bauer Drain. The map is a story map, meaning it has a series of slides that tell a story about the Red Cedar River.