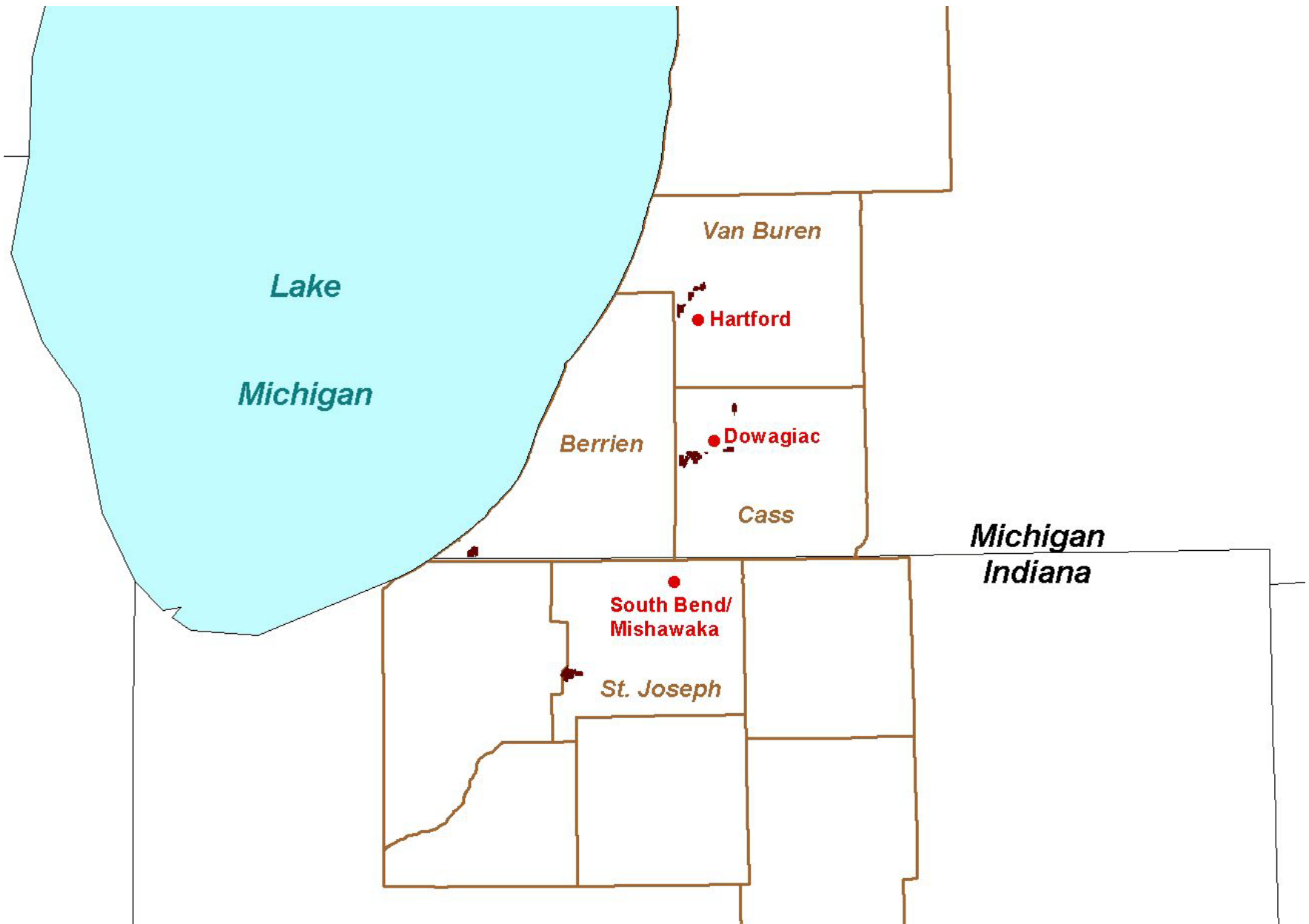
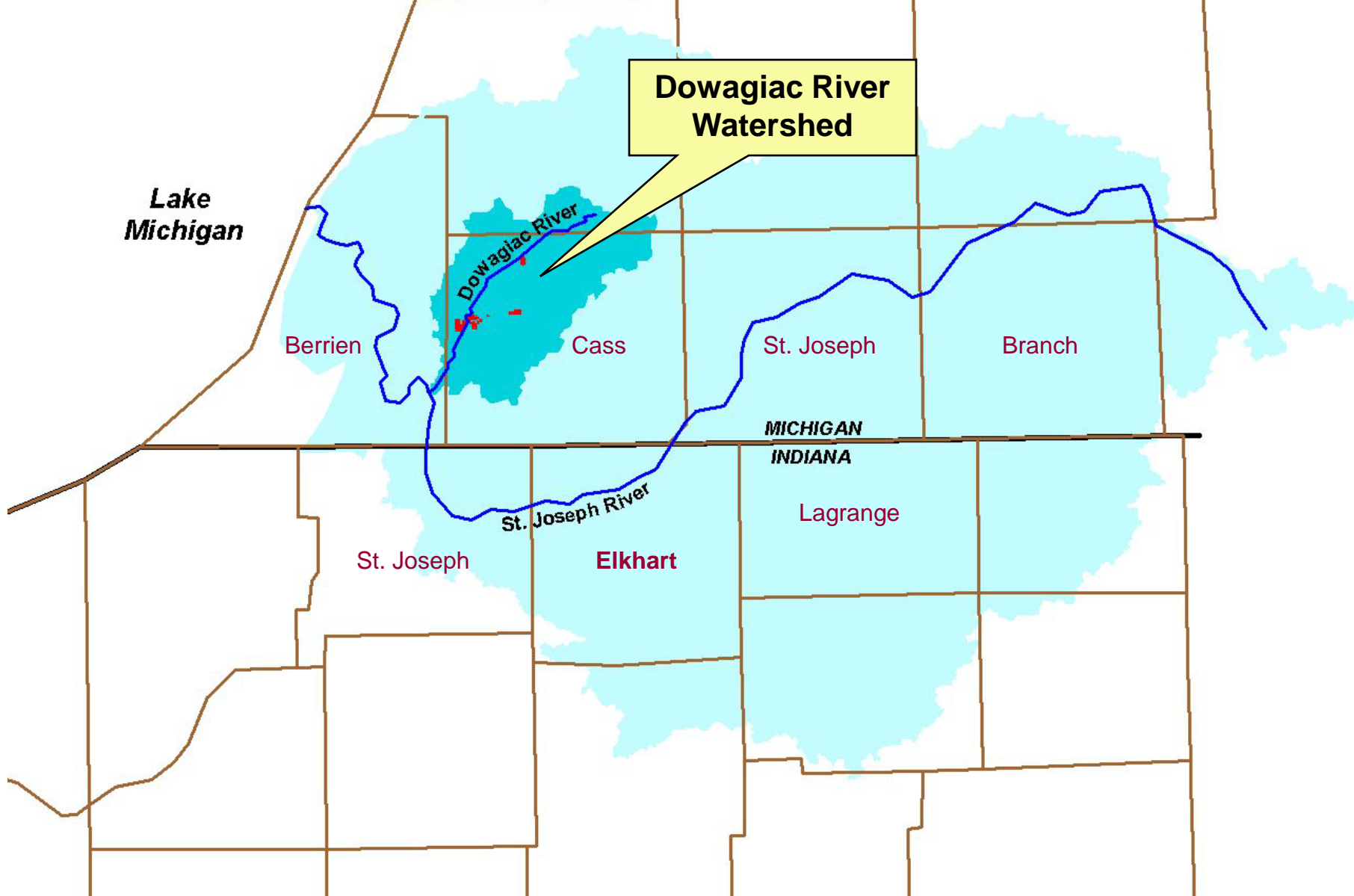




**Green Infrastructure Workshop, April 26, 2010**



***Pokagon Band of Potawatomi Properties - 2009***



***Sub-watershed of St. Joseph River Watershed***



The Dowagiac River and its wetlands has long been a significant hunting and settlement area for the Potawatomi

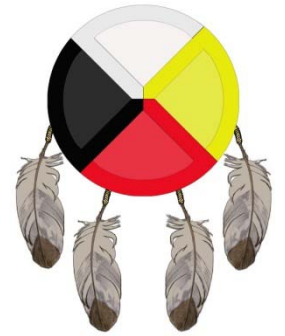
The name “Dowagiac” is an adaptation of the Potawatomi description for “a place to hunt, fish and forage”



## **Pokagon Band Tribal Mission Statement**

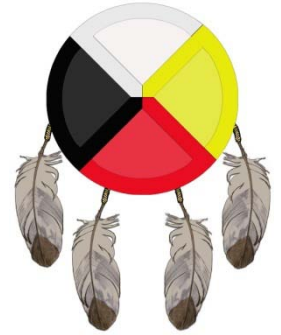
***“The mission of the Pokagon Band of Potawatomi Indians is to respectfully promote and protect the culture, dignity, education, health, welfare, and self-sufficiency of our elders, our youth, our families, and our future generations while **preserving Mother Earth**. We will strive to give our people a better quality of life...”***

# Traditional Teachings & Values: “Water is Life”



- Creation Story
- Mother Earth
- Circle of Life
- Medicine Wheel
- Traditional Ecological Knowledge
- Holistic
- Stewardship
- Interrelatedness
- Harmony
- Sustainability

# Applying Traditional Teachings & Values



- Pokagon Band Tribal Government
- Tribal Constitution
- Tribal Mission Statement
- Tribal Departments (Planning Division within Pokagon DNR)
  - Programs
  - Partnerships
  - Projects & Tools

# Water quality protection has often been neglected in land use policies

- Key to understand the relationship between land use and water quality
- Create policies that protect water quality while promoting development
- Implement practices that protect water quality while developing land



# Contemporary Tribal Model of “Green Infrastructure”

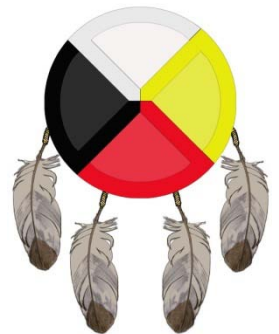
Tradition Teachings & Values



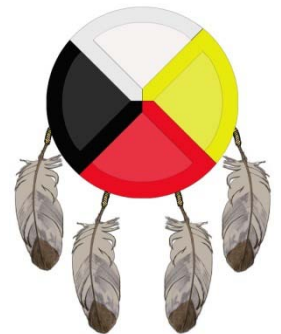
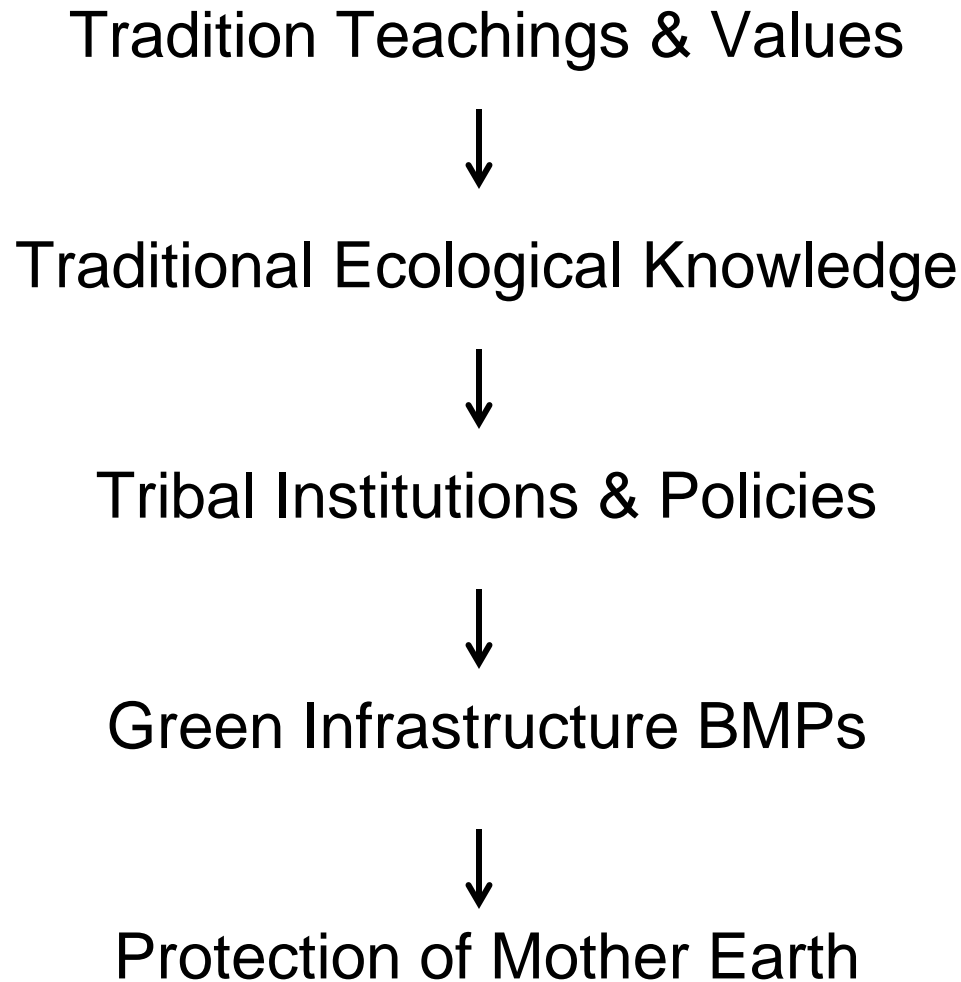
Traditional Ecological Knowledge



Protection of Mother Earth



# Contemporary Tribal Model of “Green Infrastructure”

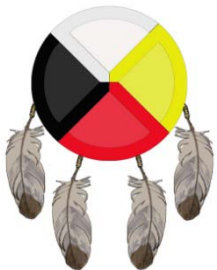
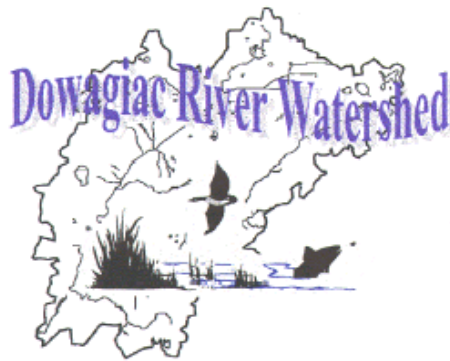


# Contemporary Tool To Respect Water Teachings...

## Dowagiac River Watershed Management Plan

October 2002

Cass County Conservation District  
1127 E. State Street  
Cassopolis, MI 49031  
(269) 445-8643 x3



# Tribal Housing Development Project



***POKAGONEK ÉDAWÁT***

***"Where Pokagons Live"***

# *Housing Development Design Principles*



## **Watershed Goal #1**

- **Protect Watershed Hydrology**
- Protect Water Quality
- Protect Natural Features
- Protect Farmland
- Protect Open Space
- Protect Rural Character

# *Housing Development Design Principles*



## **Watershed Goal #2**

**Reduce Sediment, Chemicals, and Thermal Inputs to Surface Water**

## **Watershed Goal #3**

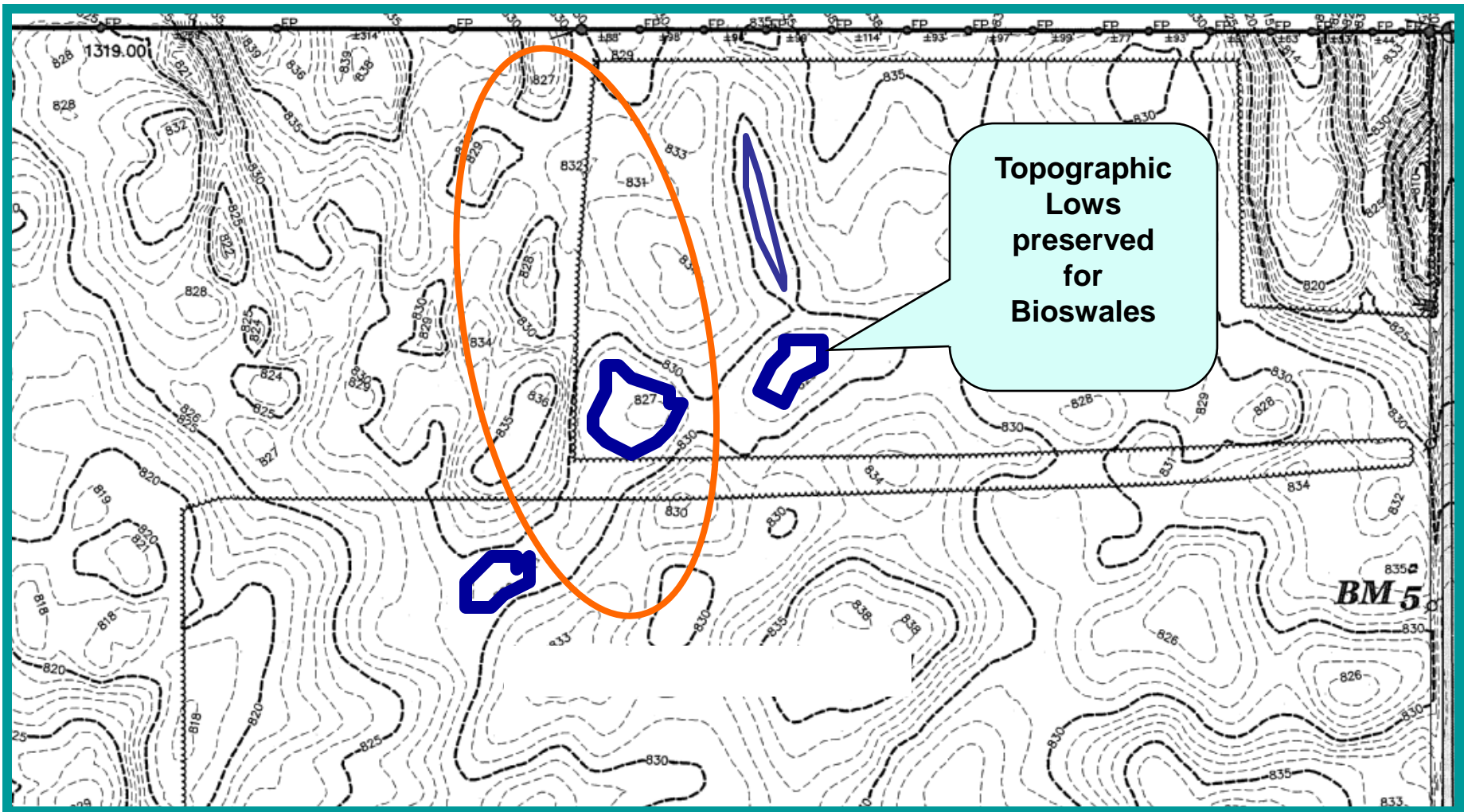
**Protect Public Water Supplies By Reducing Nutrients and Chemicals Entering Groundwater**



## Watershed Goal #1

- ✓ . Protect Watershed Hydrology
- ✓ . Protect Water Quality
- ✓ . Protect Natural Features
- ✓ . Protect Open Space
- ✓ . Protect Rural Character





***Goal #1 – Protect Watershed Hydrology  
Protect Natural Features***

***Strategy: Incorporate Design into Topography  
(utilize natural drainage patterns)***





***Goal #1 – Protect Watershed Hydrology***

***Strategy: Promote Storm Water Infiltration To Ground Water***

***Practice: Installed Bio-Swales Using Topographic Lows***



***Goal #1 – Protect Watershed Hydrology***

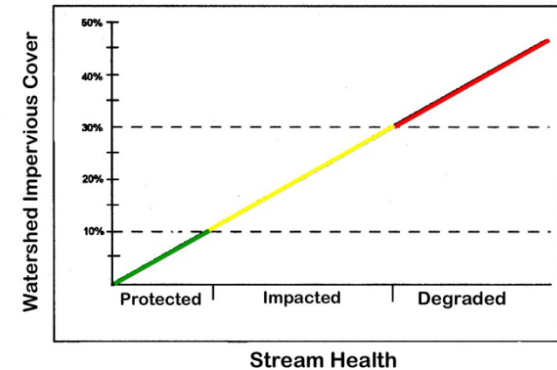
***Strategy: Promote Storm Water Infiltration To Ground Water***

***Practice: Installed Rain Gardens***





Relationship of Impervious Cover to Stream Health



**Goal #1 – Protect Watershed Hydrology  
Protect Water Quality**

**Strategy: Reduce impermeable surfaces  
Promote Infiltration**

**Practice: Installed Interlocking Pavers  
(Permeable Surface)**



**18 feet-wide driving surface**

**vs.**

**28 feet-wide driving surface**

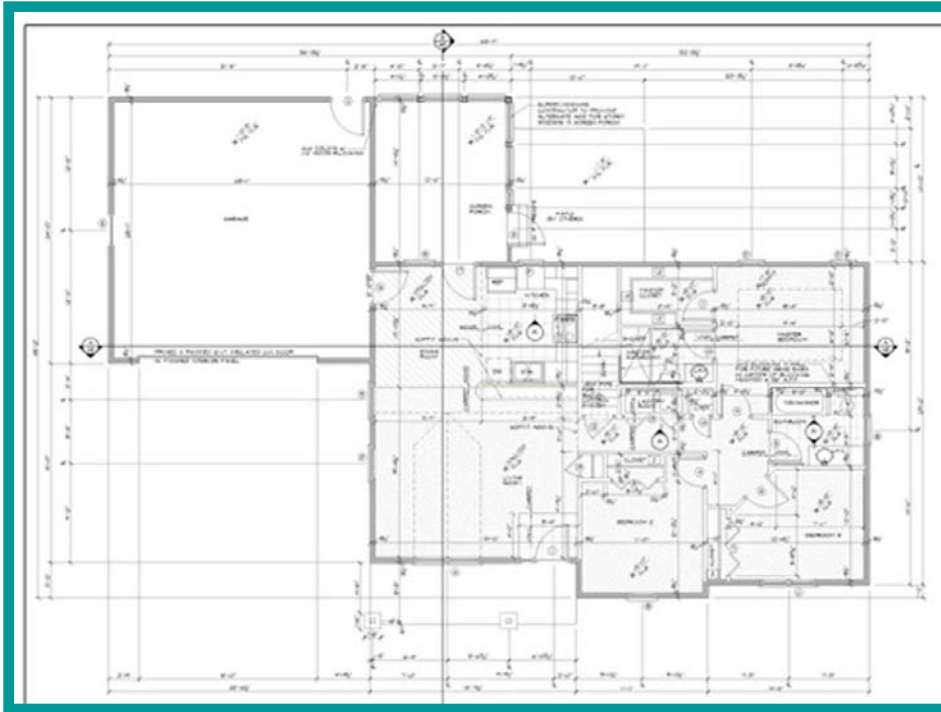
***Goal #1 – Protect Watershed Hydrology  
Protect Water Quality***

***Strategy: Reduce impermeable surfaces***

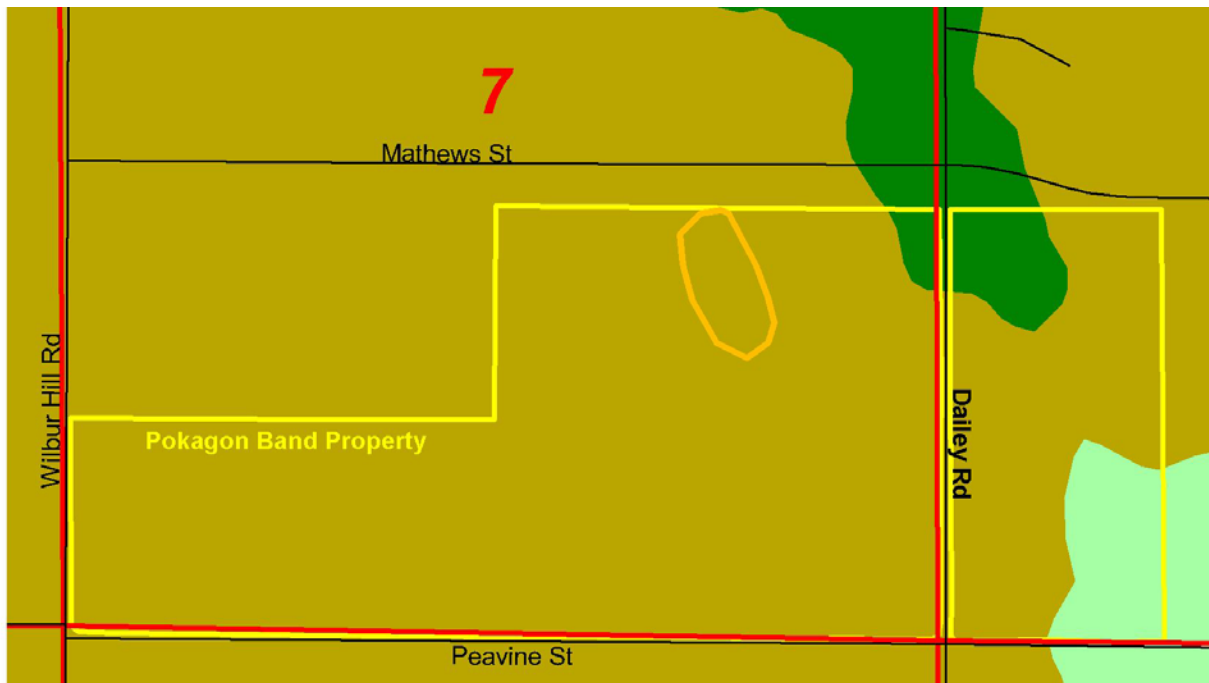
***Practice: Reduced Street Widths***

**Goal #1 – Protect Watershed Hydrology  
Protect Water Quality**

**Strategy: Reduce Impermeable  
Surfaces**




**Practice: Efficient Floor Plans  
To Reduce Footprints**



***Circa 1800 Land Cover  
Michigan Natural Features Inventory***

*As Interpreted From GLO Surveys 1816-1856*

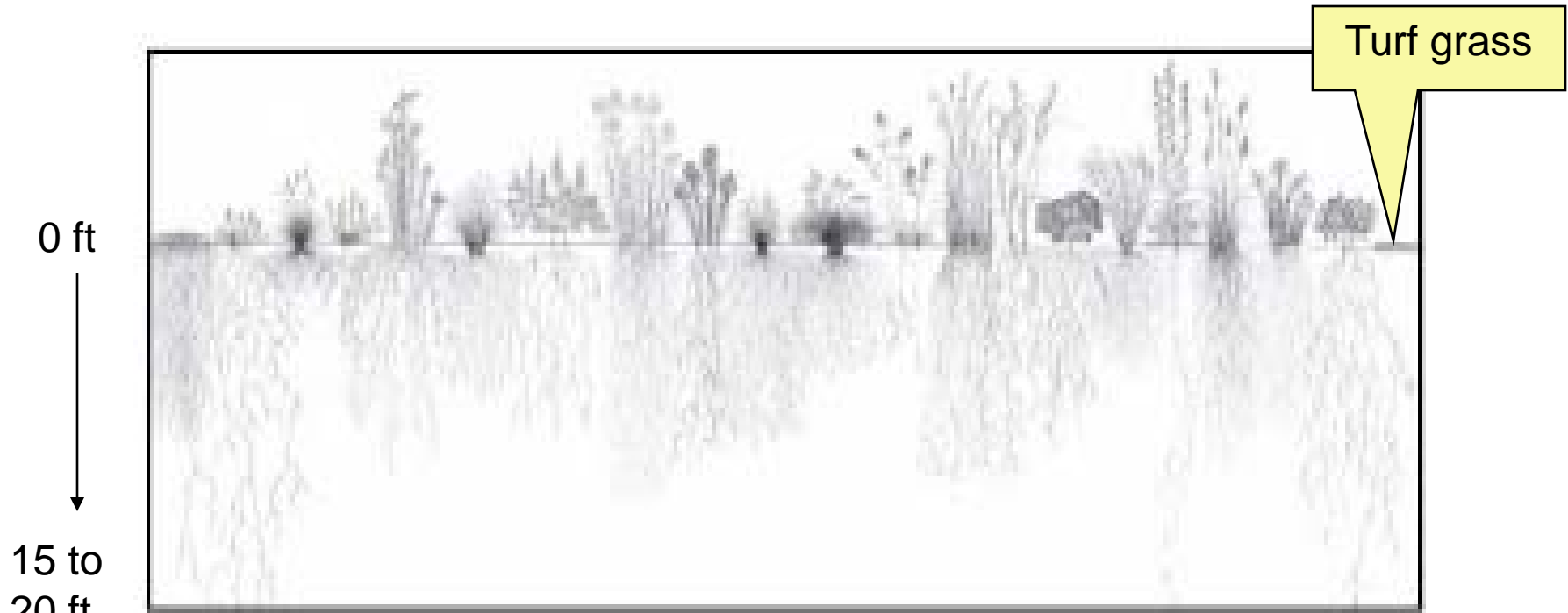
 Mixed Oak Savannah

 Oak - Hickory Forest

 Grassland

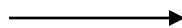
***Goal #1 – Protect Natural Features***

***Strategy: Restore Native Vegetation***



Root depth profiles for various grasses and wildflowers

**Native Vegetation  
Develops Deep Root Structures  
And Generates Soil Organic Carbon**



***Protect Watershed Hydrology  
By increasing infiltration capacity  
Protect Water Quality***





**phase 1 neighborhood plan**

Client:  
**Pokagon Band of Potawatomi Indians**  
 PO Box 120  
 Dowagiac, MI 49647  
 USA

Project Number:  
 04025 00

Date:  
 07.29.05

Wightman & Assoc., Inc.  
 2202 Poplarstone Road  
 Berlin Harbor, MI 49002



**POKAGON BAND OF POTAWATOMI INDIANS**

**Pokagonek Édawat (Where Pokagons Live)**



**Goal #1 – Protect Natural Features**

**Strategy:**

- **Prairie & Woodlands Restoration**





**Restored Vegetation**



- Wooded Areas -**
- **Cleared underbrush**
  - **Opened Canopy**





***Goal #1 – Protect Open Space***

***Strategy: Cluster Development***

***43 acres***

***17 homes***

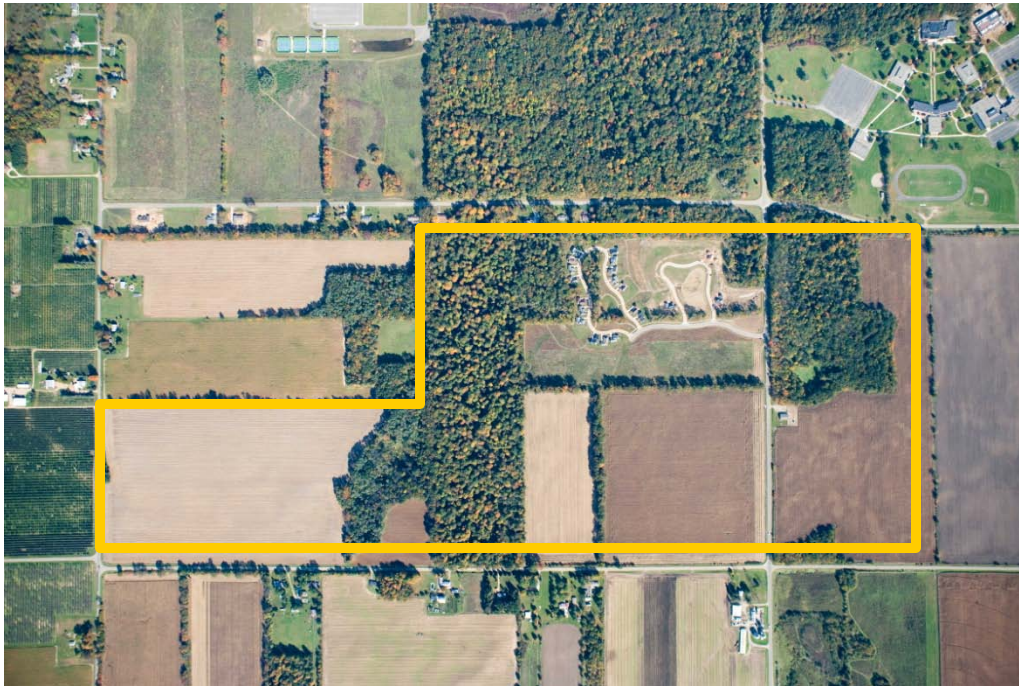
***38 acres of open space***



# Goal #1 – Preserve Rural Character

## Strategy:

- **Cluster Development**
- **Restore Vegetation**
- **Neighborhood Is Set Back From Roads**
- **Proposed To Install Centralized, On-site Wastewater Treatment (No intrusion of urban infrastructure)**



### concept plan

Client:  
Pokagon Band of Potawatomi Indians  
PO Box 160  
Chandler, NE 68027

Wightman & Assoc., Inc.  
1205 Poplar Street  
Bismarck, NE 68002

Project Number:  
03022-00  
Date:  
06.20.23

### Dailey Road Housing Development



POKAGON BAND OF  
POTAWATOMI INDIANS

0 150 300  
1" = 300'  
North







## **Watershed Goal #2**

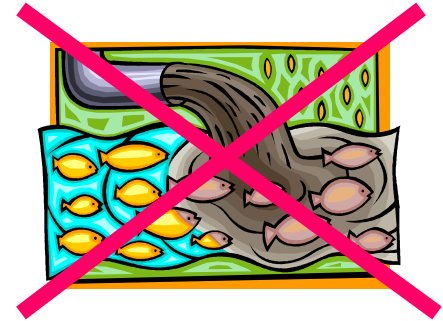
**Reduce Sediment, Chemicals,  
And Thermal Inputs To Surface Water**

***Watershed Goal #2 – Reduce Sediment, Chemicals, Nutrients,  
And Thermal Inputs To Surface Water***

***Strategy:***

- ***Utilize Infiltration Techniques***

***No Conveyance To Surface Water***



- ***Restore Native Vegetation***

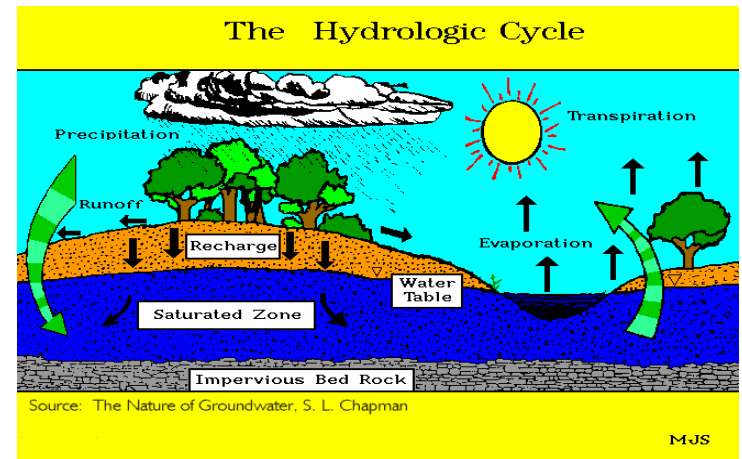
***No Fertilizers, No Chemicals Needed For Maintenance***



## **Watershed Goal #2 – Reduce Sediment, Chemicals, Nutrients, And *Thermal Inputs* To Surface Water**

**Strategy: Work with Hydrologic Cycle  
No Conveyance To Surface Water**

**Practice: Proposed Installation of  
Centralized, On-site  
Wastewater Treatment System**



**Local Municipal WWTP is a Thermal Discharge to the Cold-Water System**



## **Watershed Goal #3**

**Protect Public Water Supply By Reducing  
Nutrients & Chemicals Entering Groundwater**

***Watershed Goal #2 – Reduce Sediment, Chemicals, Nutrients,  
And Thermal Inputs To Surface Water***

***Watershed Goal #3 – Protect Public Water Supply By Reducing Nutrients  
And Chemicals Entering Ground Water***

***Strategy:***



***Restore Native Vegetation  
in Open Space Areas***



***Limit Turf –  
Install Wildflower Gardens***

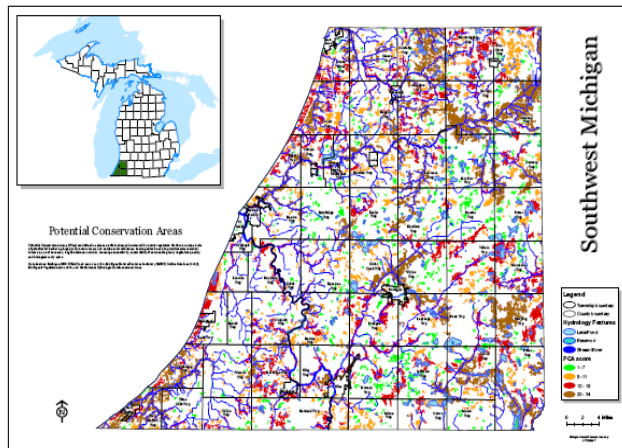
***No Fertilizers Or Lawn Chemicals Utilized***



# Another Contemporary Tool...

## Berrien, Cass, and Van Buren Counties Potential Conservation Areas

Providing Ecological Information  
For a Green Infrastructure Plan



Prepared by:  
Michigan Natural Features Inventory

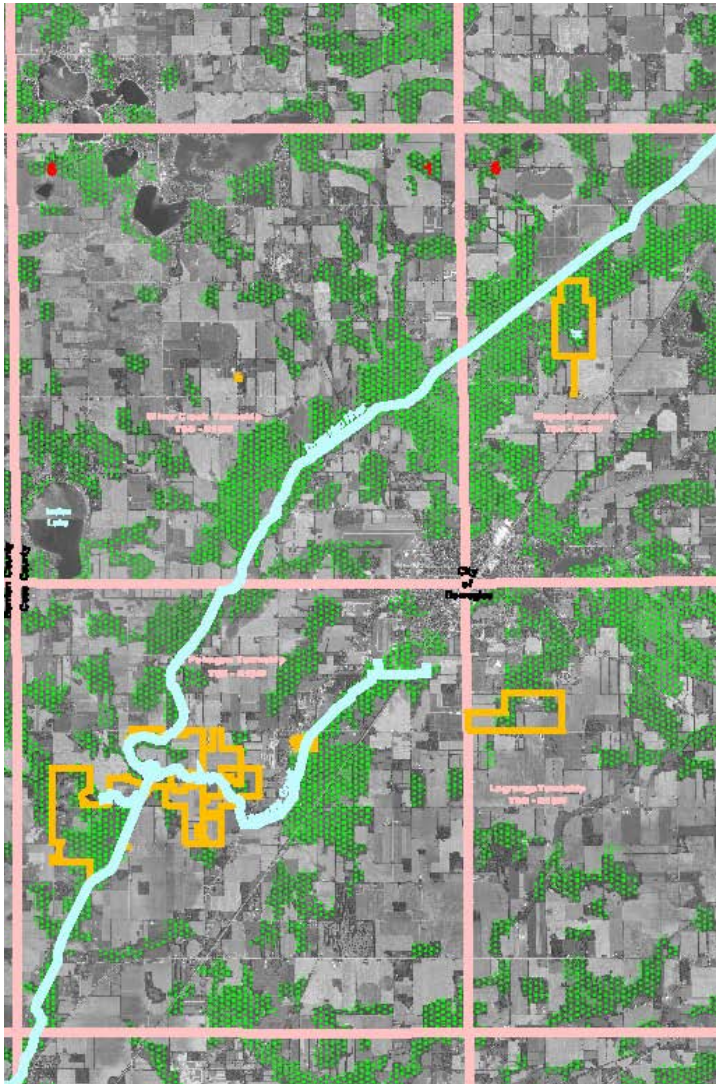
Submitted August 29, 2007

Prepared for:  
Southwest Michigan Planning Commission

## Southwest Michigan Planning Commission's Green infrastructure Project

# Southwest Michigan Planning Commission's Green infrastructure Project

## Cass, Van Buren, Berrien Counties



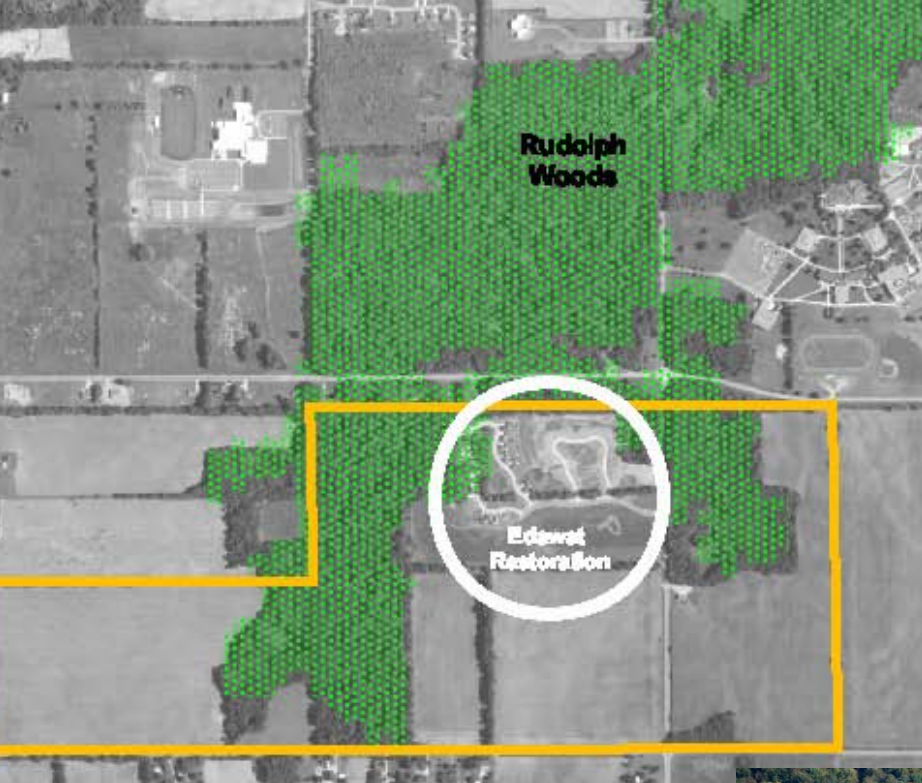
**Potential Conservation Areas  
Mapped by  
Michigan Natural Features Inventory  
August 29, 2007**

**Connect networks of natural areas & other  
open spaces**

**Planned & Managed to conserve natural  
ecosystems**

**Maintain environmental benefits**





**Development & Conservation  
is compatible**

**Enhanced habitat  
Rather than further fragment**

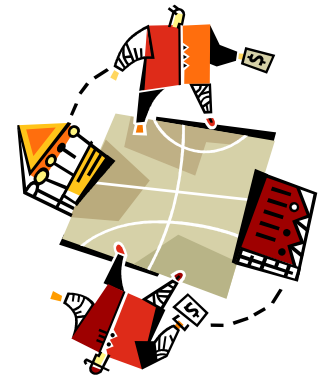
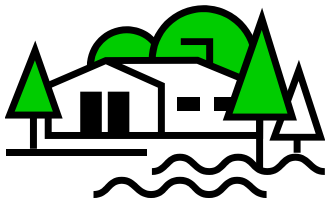
**Restoring landscape's  
role in the water cycle**




# ***LOW IMPACT DEVELOPMENT***




# ***QUALITY LIVING ENVIRONMENT***






## Galien River Watershed Management Plan

MDEQ Tracking Code #2000-0122



Prepared for  
Berrien County Drain Commissioner

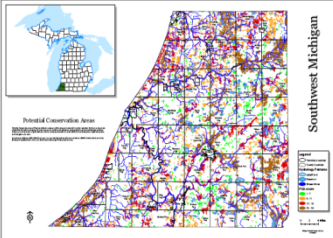
by




This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement (C487014-01) to Berrien County Drain Commissioner, 2000-0122. The contents of the document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

## Berrien, Cass, and Van Buren Counties Potential Conservation Areas

Providing Ecological Information For a Green Infrastructure Plan



Prepared by:  
Michigan Natural Features Inventory  
Submitted August 29, 2007

Prepared for:  
Southwest Michigan Planning Commission




# Pokegnek Bodewadmik

## Master Plan

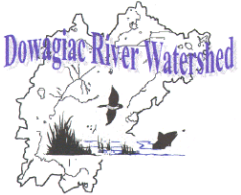
### &

## Land Use & Conservation Code

## Dowagiac River Watershed Management Plan


October 2002

Cass County Conservation District  
1127 E. State Street  
Cassopolis, MI 49621  
(269) 445-8643 x3



## Paw Paw River Watershed Management Plan

*"A Guide for the Protection and Improvement of Water Quality"*



August 2008

# Dowagiac River Watershed Management Plan

October 2002

Cass County Conservation District  
1127 E. State Street  
Cassopolis, MI 49031  
(269) 415-8643 x3

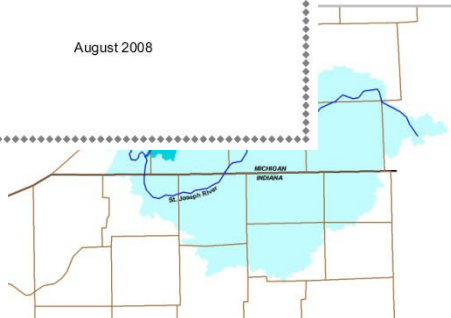


# Paw Paw River Watershed Management Plan

*"A Guide for the Protection and Improvement of Water Quality"*



August 2008



Sub-watershed of St. Joseph River Watershed

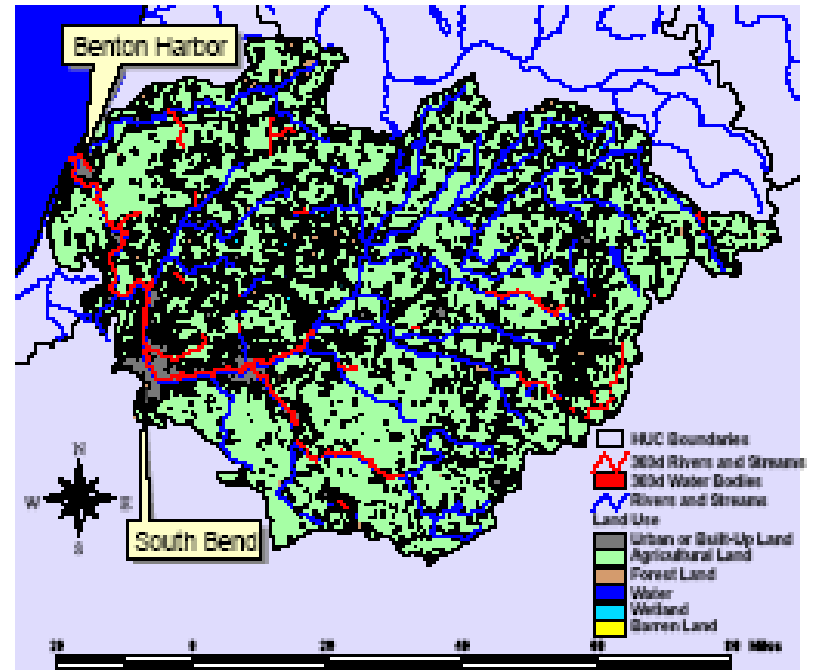


# St. Joseph River Watershed

Hydrologic Unit Code: 04050001




For more information, see the USEPA "Surf Your Watershed" website at [http://cfpub.epa.gov/surf/huc.cfm?huc\\_code=04050001](http://cfpub.epa.gov/surf/huc.cfm?huc_code=04050001)





# St. Joseph River Watershed

Hydrologic Unit Code: 04050001

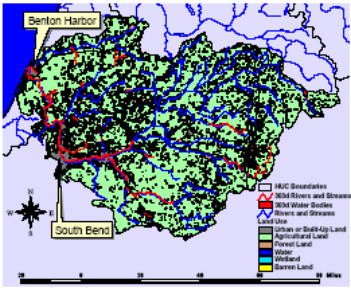


**St. Joseph River Watershed**  
Hydrologic Unit Code: 04050001

For more information, see the USEPA "Surf Your Watershed" website at [http://cfpub.epa.gov/surf/huc.cfm?huc\\_code=04050001](http://cfpub.epa.gov/surf/huc.cfm?huc_code=04050001)

**Watershed Overview / Ecology / Biodiversity**

- The St. Joseph River Watershed is located in the southwest portion of the Lower Peninsula of Michigan and northwestern portion of Indiana. It spans the Michigan-Indiana border and empties into Lake Michigan at St. Joseph, Michigan.
- The watershed drains 4,685 square miles from 15 counties (Berrien, Branch, Calhoun, Cass, Hillsdale, Kalamazoo, St. Joseph and Van Buren in Michigan and De Kalb, Elkhart, Kosciusko, Lagrange, Noble, St. Joseph and Steuben in Indiana).
- The watershed includes 9,742 river miles and flows through and near the Kalamazoo-Portage, the Elkhart-Goshen, the South Bend and the St. Joseph/Benton Harbor metropolitan areas.



**Watershed Activities / Concerns / Priorities**

- A Watershed Management Plan for the St. Joseph River basin, led by the Friends of the St. Joseph River, will be prepared through funding by the Michigan Department of Environmental Quality and include the Indiana portion of the basin.
- The St. Joseph watershed project has generated maps of subwatersheds, cities, USGS water resources stations, digital elevations, wetlands, river valley segments, land use, average annual precipitation, 1950-1999, designated trout streams, geological features, and soils.
- Under the Dowagiac River watershed management plan, nine municipalities in the Dowagiac River watershed have or will receive technical and/or financial assistance to work on master plans and zoning ordinances to protect farmland, open space, rural character, wetlands, floodplains and water quality.
- Pokagon Band of Potawatomi tribe is involved in Dowagiac River watershed.

**Approved Watershed Management Plans**

- Dowagiac River - Cass Conservation District, <http://users.beanstalk.net/casscons>
- Nottawa Creek - Calhoun Conservation District <http://www.calhouncd.org/>

**Watershed Groups**

- Friends of the St. Joseph River <http://www.fotsjr.org/>
- St. Joseph River Basin Commission <http://www.sjrbcc.com/>
- Cass Conservation District
- Calhoun Conservation District



## Basin Prioritization of Concerns

■ The Watershed Concerns have been prioritized by the Steering Committee, according to the importance of each concern and the ease of implementing BMPs to correct those concerns in the following manner:

1. Sediments (tie)
2. Nutrients (tie)
3. Habitat Loss
4. Wetlands (tie)
5. Animal Waste (tie)
6. Pesticides (tie)
7. Urbanization & Land Use (tie)
8. Biota
9. CSO's
10. Pathogens (tie)
10. Hydrologic Modification (tie)
10. Litter (tie)

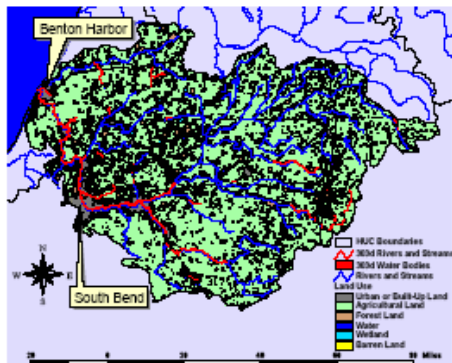




## St. Joseph River Watershed

Hydrologic Unit Code: 04050001

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### Approved Watershed Management Plans

- Dowagiac River - Cass Conservation District, <http://users.beanstalk.net/casscons>
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- 

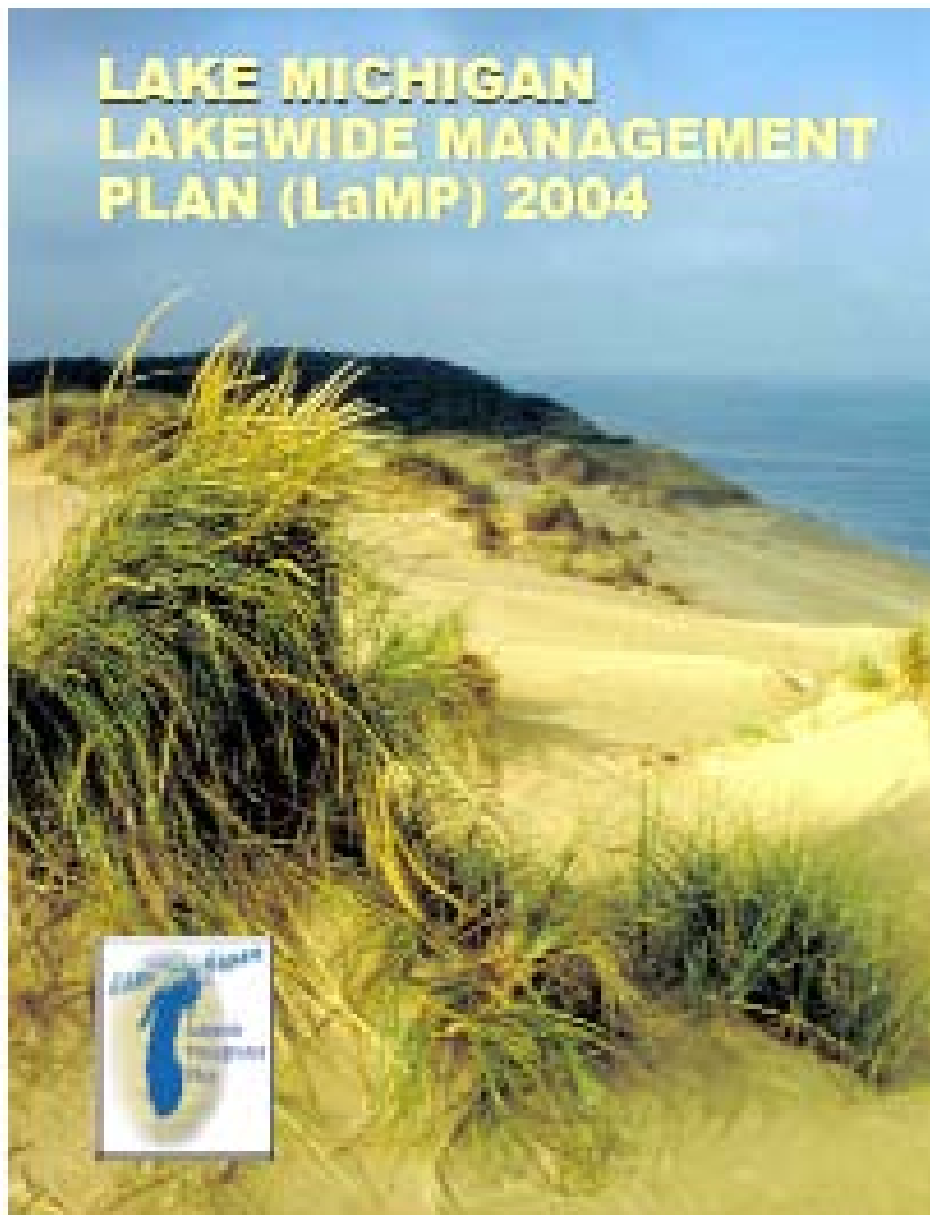
### Watershed Groups

- Friends of the St. Joseph River <http://www.fotjr.org/>
- St. Joseph River Basin Commission <http://www.sjrb.com/>
- Cass Conservation District
- Calhoun Conservation District

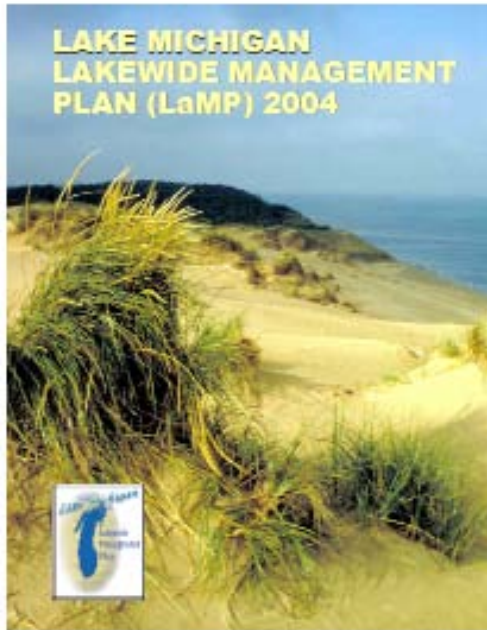
### Watershed Overview / Ecology / Biodiversity

The St. Joseph River Watershed is located in the northwest corner of the

# LAKE MICHIGAN LAKEWIDE MANAGEMENT PLAN (LaMP) 2004







## Great Lakes Water Quality Agreement as amended 1987

***U.S. & Canada  
Pledged Their Determination***

***"to restore and maintain the chemical,  
physical, and biological integrity  
of the waters of the Great Lakes Basin  
Ecosystem."***





Humankind has not  
woven the web of life.

We are but one thread within it.

Whatever we do to the web,  
we do to ourselves.

All things are bound together.

All things connect.

-Chief Seattle-





***Mark Parrish***  
***58620 Sink Rd.***  
***Dowagiac, MI 49047***  
***269-782-9602***  
***mark.parrish@pokagonband-nsn.gov***