

# Hickory Creek Watershed

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**Southwest Michigan Planning Commission**

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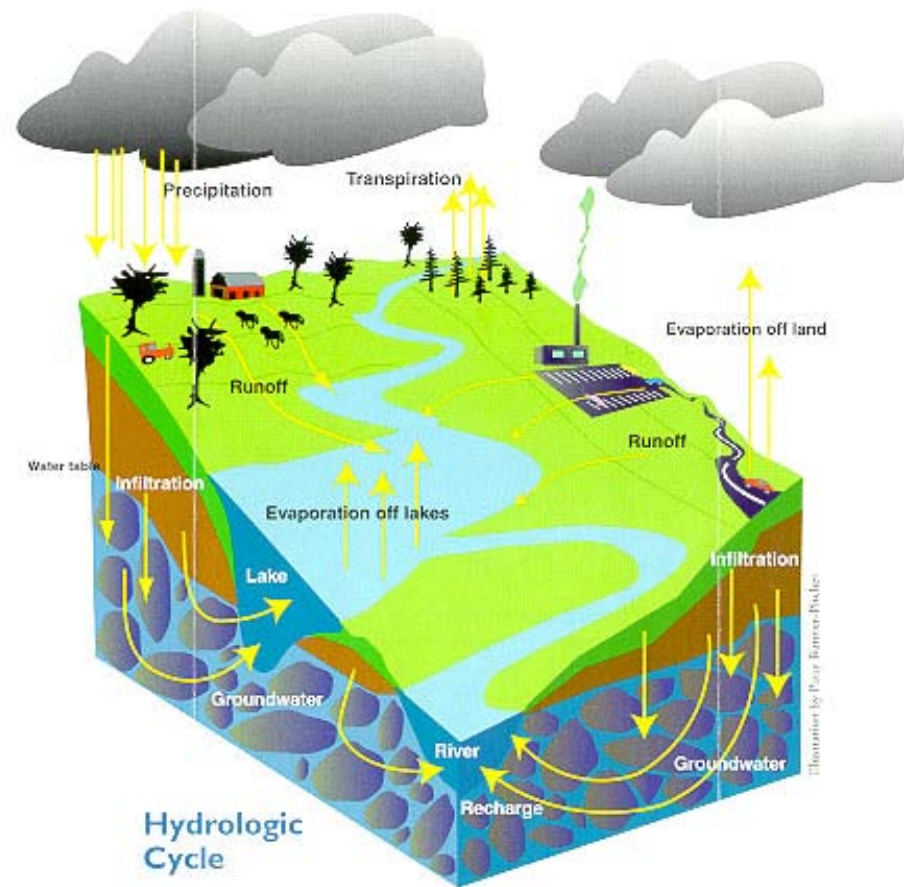
**Village of Stevensville**

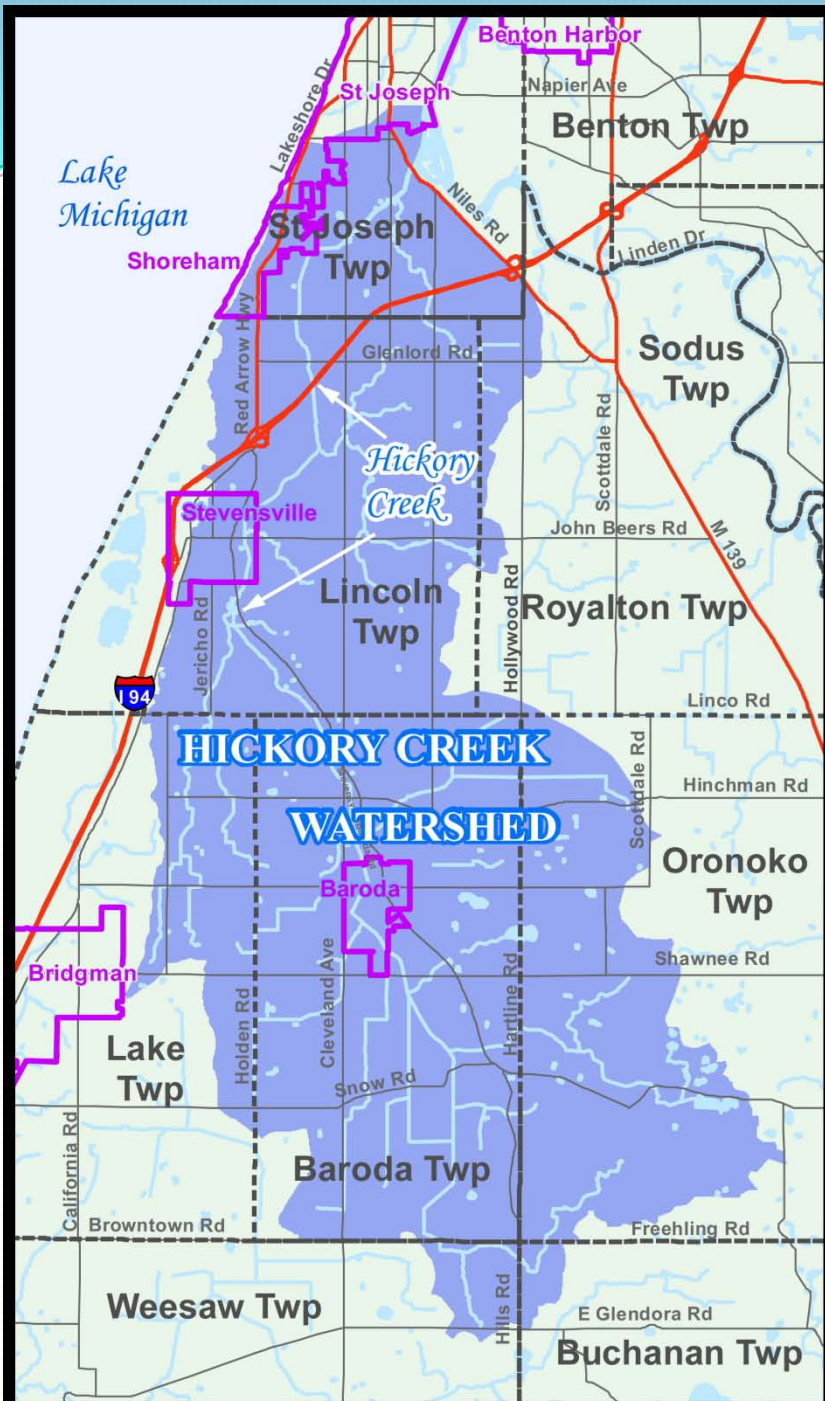


# What is a Watershed?

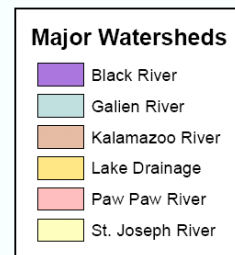
☛ The land area that drains into a common body of water.

☛ A watershed crosses political boundaries connecting several municipalities by water.

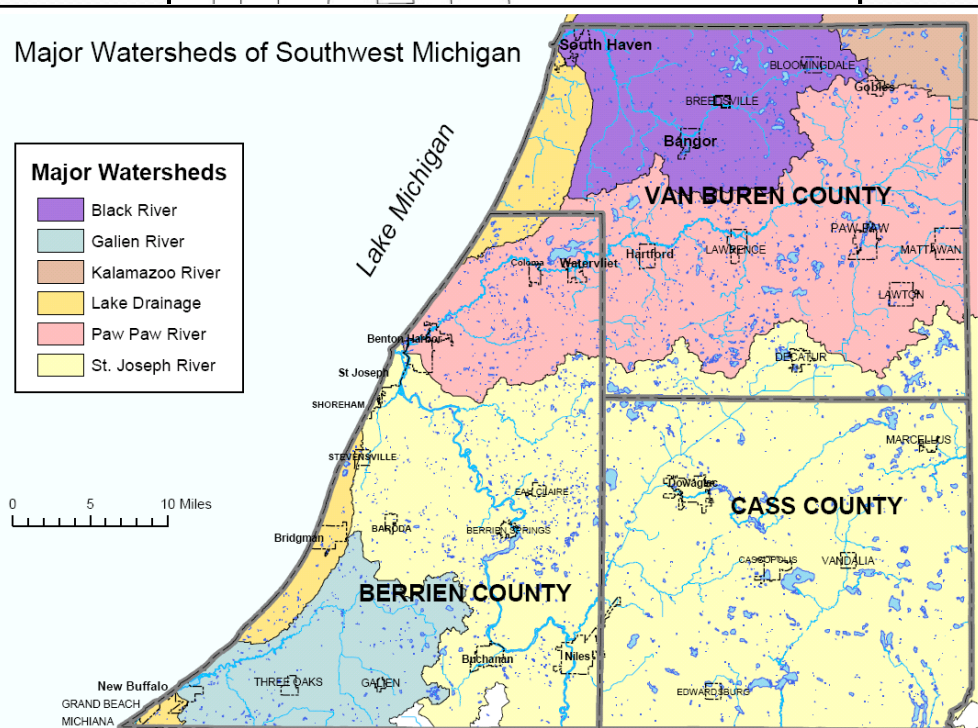




Major Watersheds of Southwest Michigan



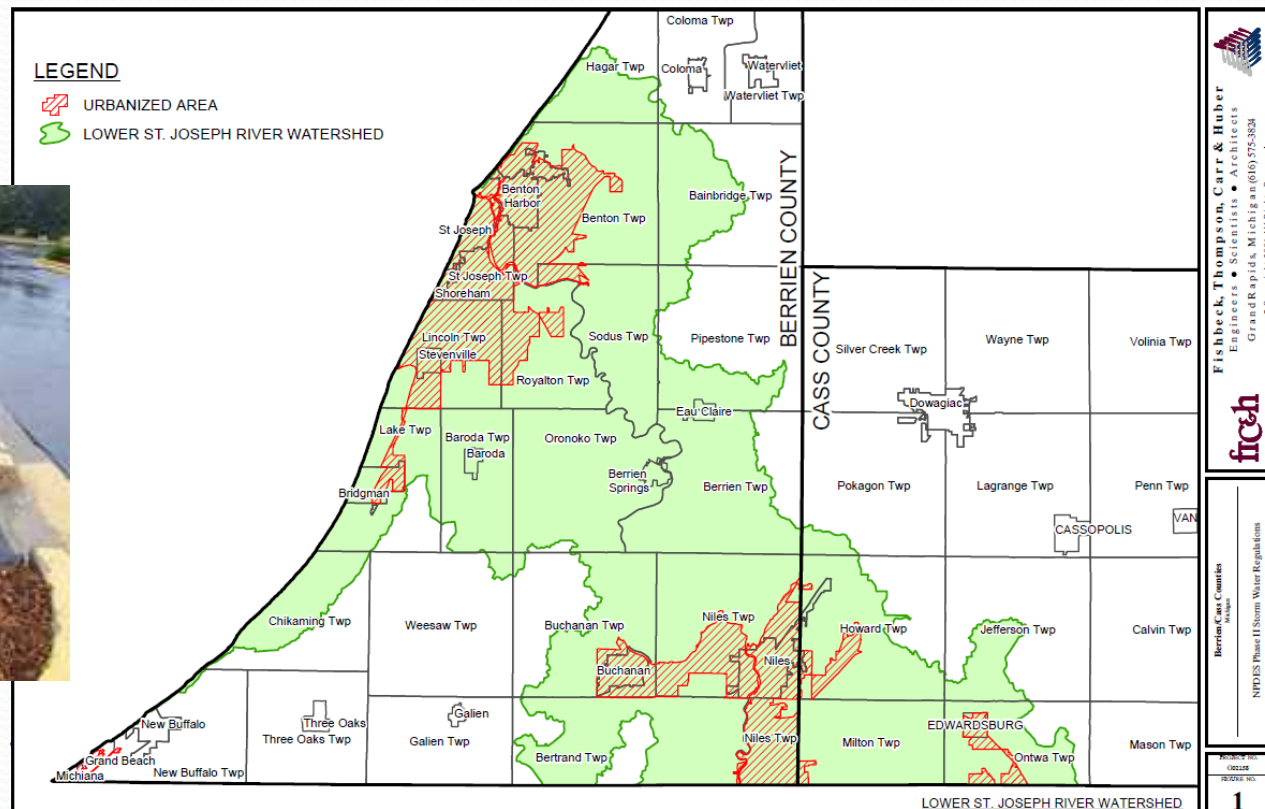
0 5 10 Miles





# Municipal Storm Water Phase II

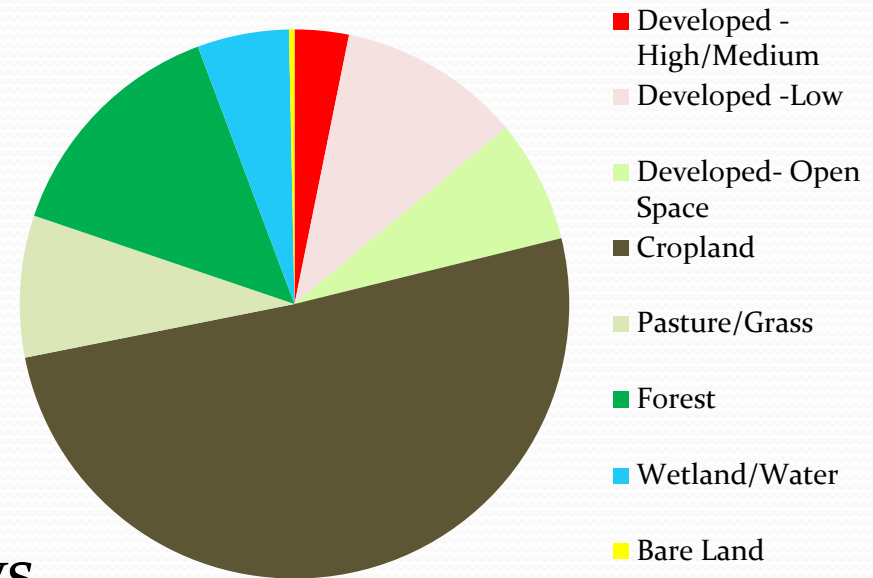
Municipal storm sewer systems in urban areas with populations over 50,000 and a high population density (1,000 people per square mile).



# About Hickory Creek

- Cold water stream – designated trout stream
- Drains 53 square miles ~ 34,000 acres
- Land Use

- Developed 14%
- Cropland/Pasture 58%
- Forest 14%
- Wetland/Water 5%



- The Most Recent Survey Says...
  - Macro invertebrate community (2006)
    - At Cleveland Road - acceptable (-1) trending toward poor
    - At Snow Road – poor (-7)

Lake Michigan

## Hickory Creek Watershed Land Use/Cover


### Legend

 Hickory Creek Watershed

 Hydrology

#### Land Use/Cover


 Developed, High & Medium Intensity

 Developed, Low Intensity

 Bare Land

 Developed, Open Space

 Forest

 Wetland

 Cultivated Crops

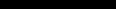
 Grassland/Pasture/Hay

 Open Water


## Legend





Hickory Creek Watershed


 Hydrology

### Land Use/Cover


 Developed, High & Medium Intensity


 Developed, Low Intensity


 Bare Land

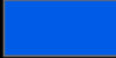
 Developed, Open Space

 Forest

 Wetland

 Cultivated Crops

 Grassland/Pasture/Hay

 Open Water

0 0.5 1 2 Miles

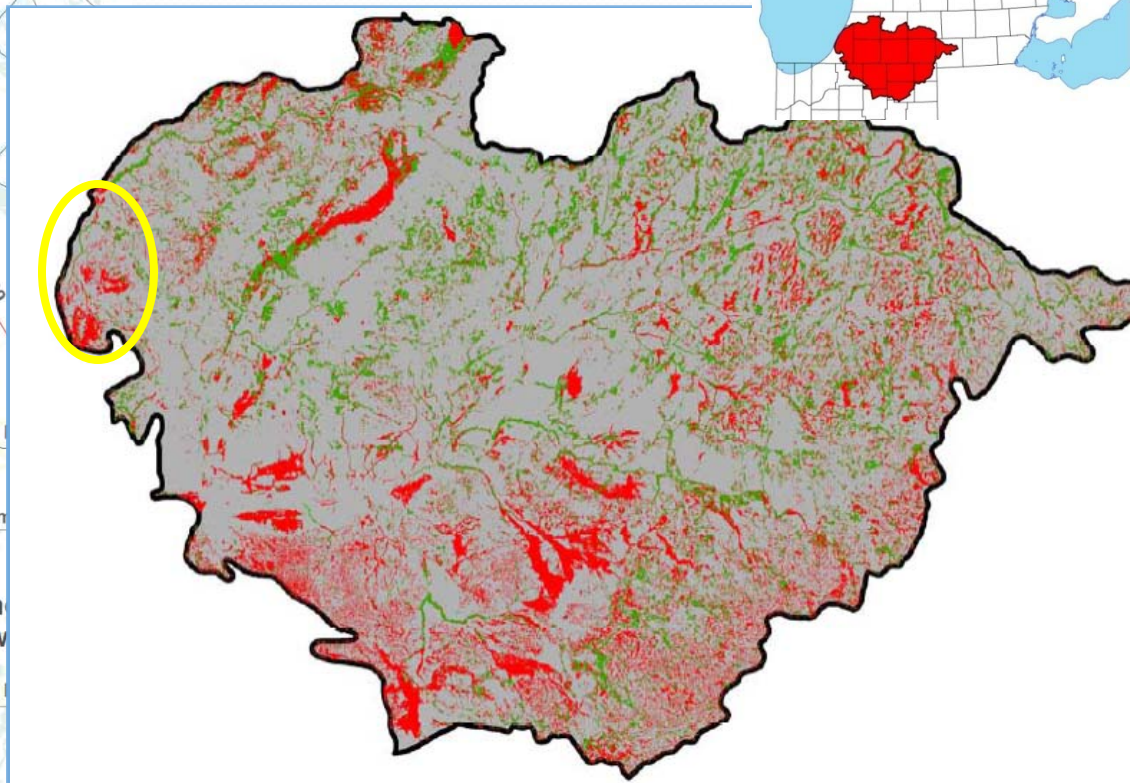
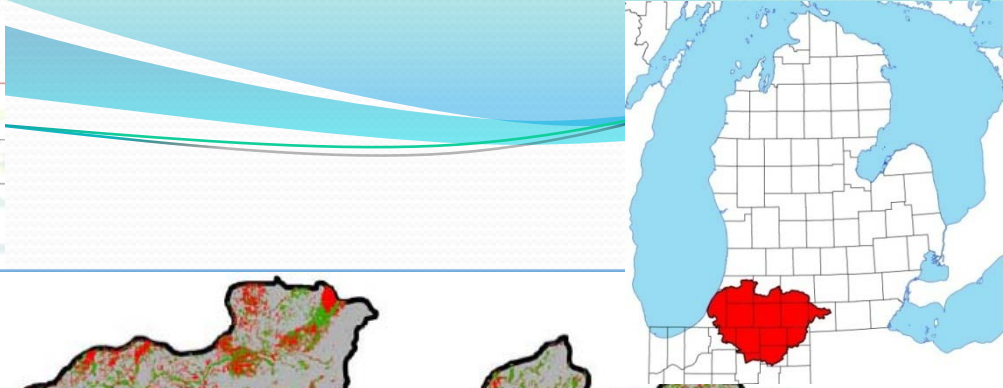
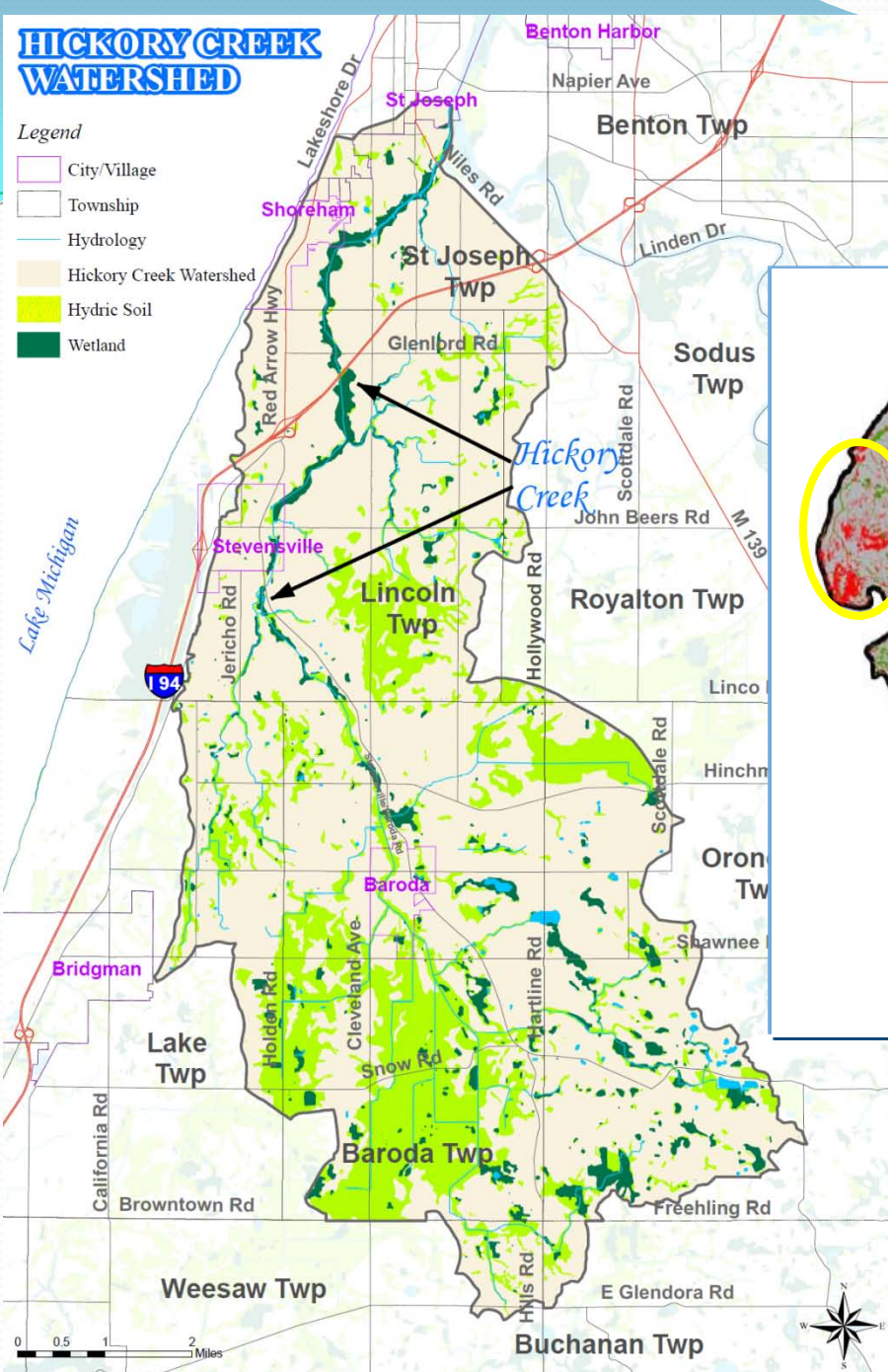




# HICKORY CREEK WATERSHED

## Legend

- City/Village
- Township
- Hydrology
- Hickory Creek Watershed
- Hydric Soil
- Wetland



 Wetland Lost

 Wetland Existing

# HICKORY CREEK WATERSHED

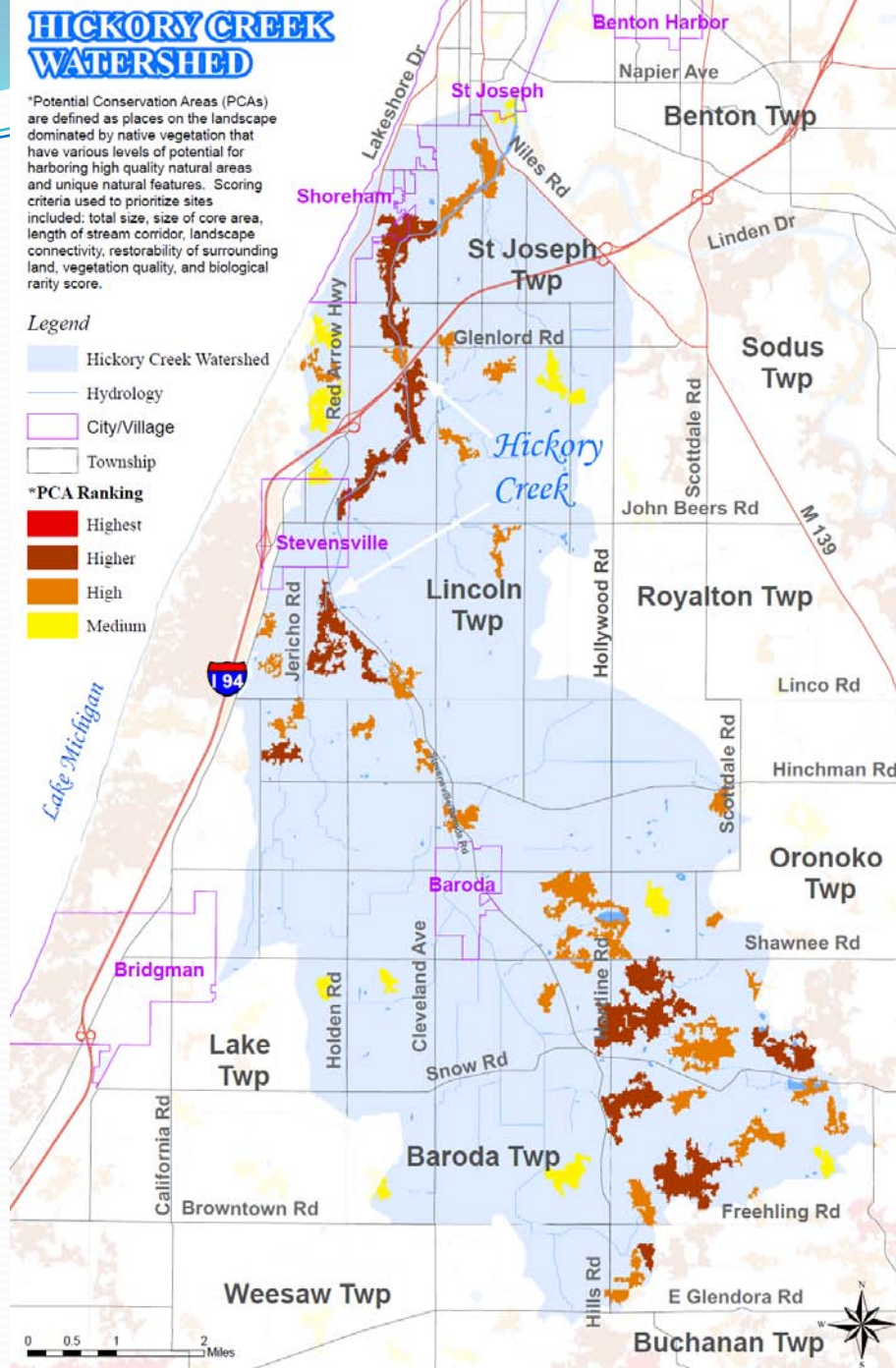
\*Potential Conservation Areas (PCAs) are defined as places on the landscape dominated by native vegetation that have various levels of potential for harboring high quality natural areas and unique natural features. Scoring criteria used to prioritize sites included: total size, size of core area, length of stream corridor, landscape connectivity, restorability of surrounding land, vegetation quality, and biological rarity score.

## Legend

- Hickory Creek Watershed
- Hydrology
- City/Village
- Township

## \*PCA Ranking

- Highest
- Higher
- High
- Medium



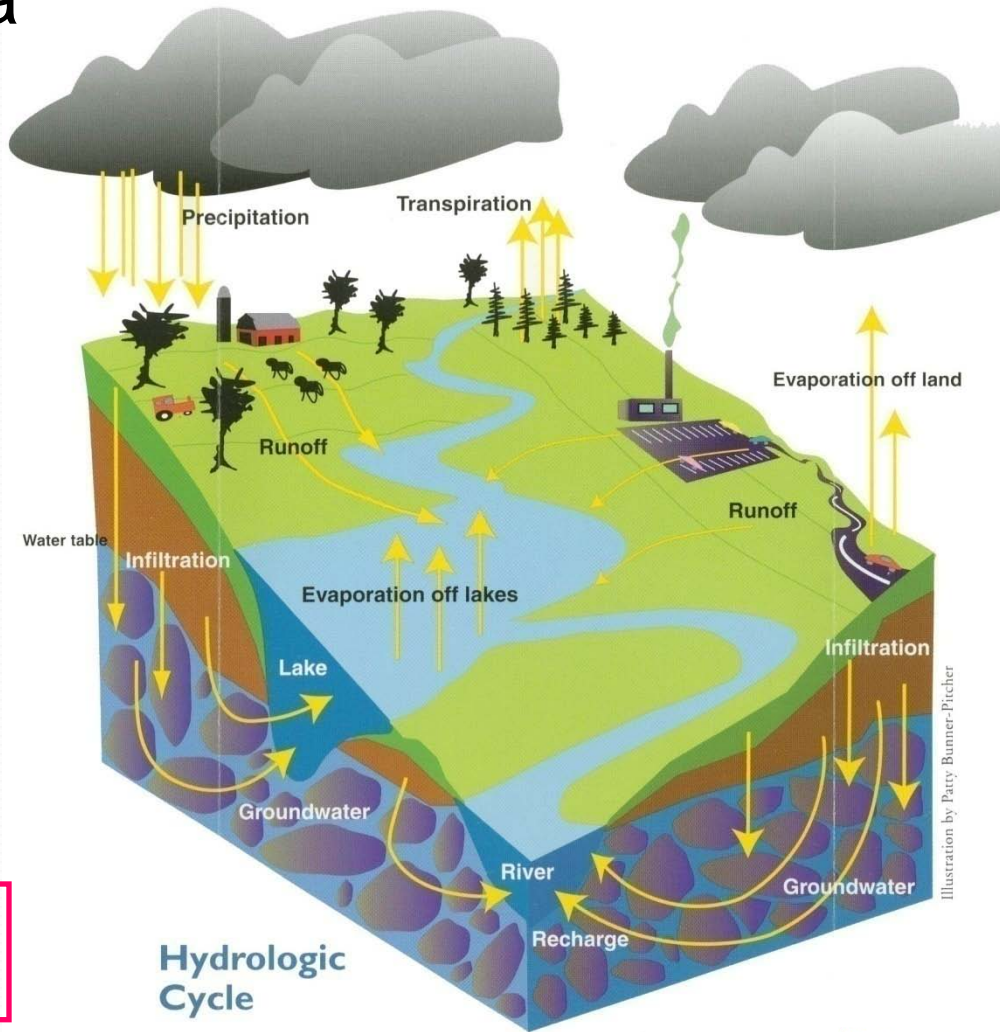


# Two Types of Pollution

☛ **Point Source** - from a specific source such as an industrial discharge or a discharge from a wastewater treatment plant

☛ **Polluted Runoff** - runoff from the land or watershed area

**Over 60% of water pollution comes from polluted runoff!**



# SJRW Management Plan

## Major Pollutants:

- **Flashiness (flooding)**
- **Sediment**
- Nutrients
- Pathogens
- Pesticides/Toxins

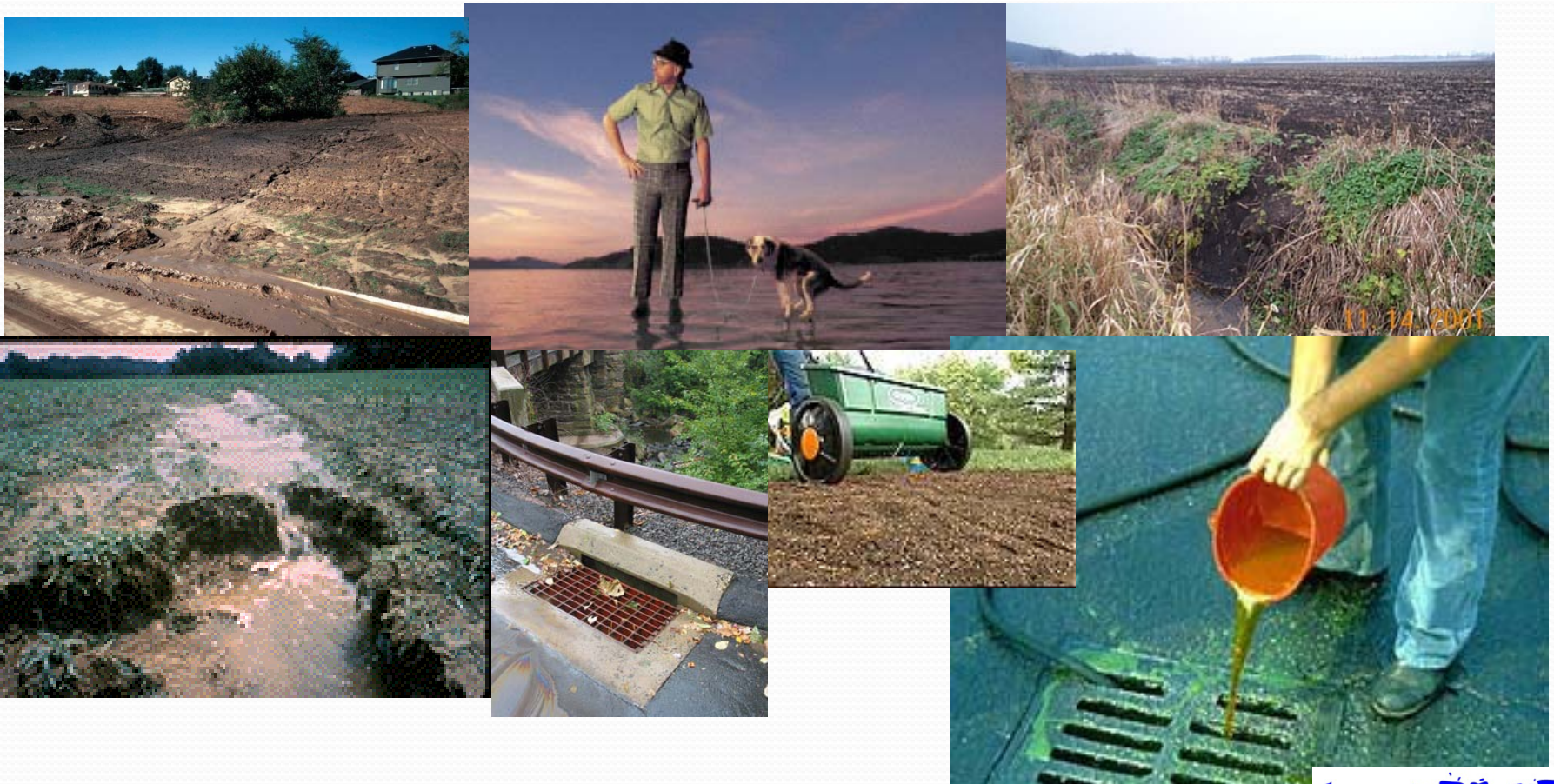
## Major Sources:

- Loss of wetlands
- Straightening/dredging
- Impervious surfaces
- Agricultural runoff
- Urban runoff
- Construction site runoff





Most water pollution comes from **EVERYDAY** activities of households and landowners.





# Why care?



Increased chance of **contaminated drinking water** supplies



Decreases in property values



Reduces fish - Sand covers spawning habitat in streams. Increased *algae blooms* can cause fish kills



Increased need to dredge harbor



Increased beach closures.

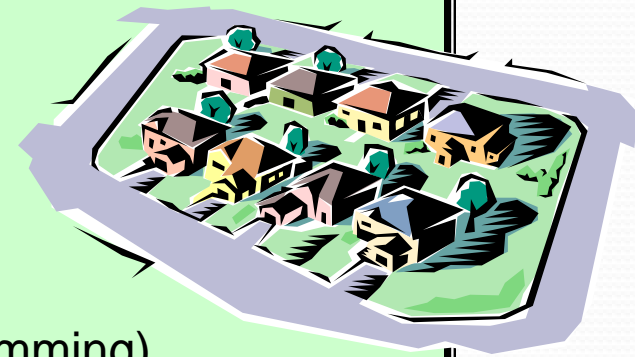


# Land Development and Water Quality

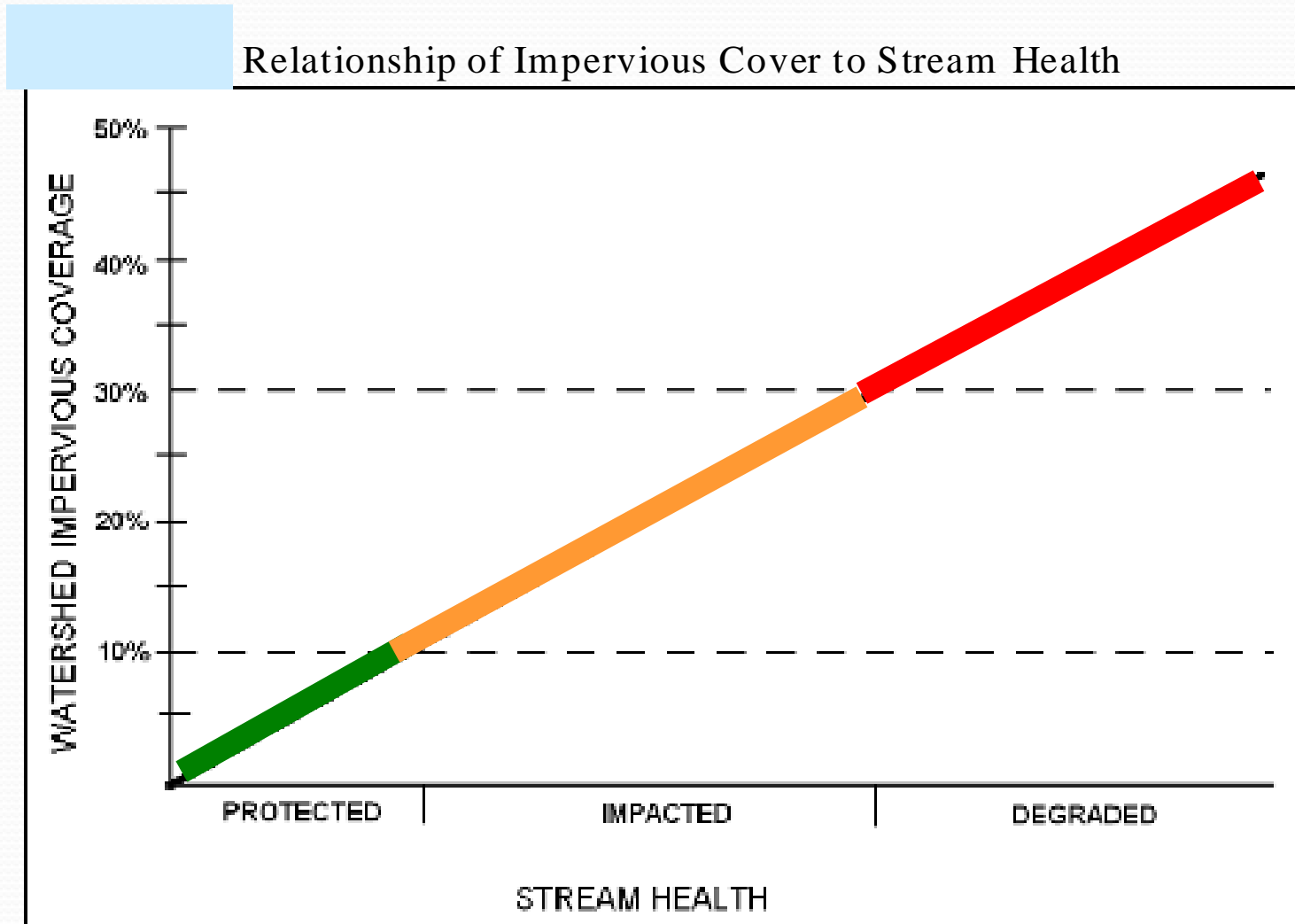
Land development that **does *not*** utilize **Low Impact Development** can have a significant impact on water quality in a watershed.

## Increased impervious surfaces result in:

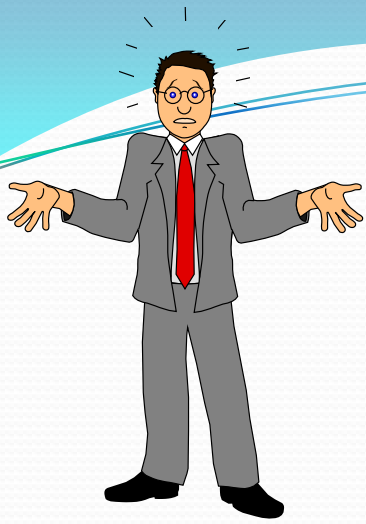
- ✓ Increased flooding
- ✓ Increased sedimentation of water
  - ✓ Harbors and lakes filling with sediment
  - ✓ Impacts on wildlife, especially fish
- ✓ Increased pollutants causing
  - ✓ Recreational uses limitations (restrictions on swimming)
  - ✓ Human health impacts
  - ✓ Wildlife health impacts (fish, birds, etc.)



# What is Impervious Cover? roofs, roads, parking lots







## The bad news:

Increased development will increase impervious surfaces and will **negatively affect water quality.**

## The good news:

In Berrien County and SW Michigan, we have the **opportunity** to develop in a manner that will decrease the impacts to water quality.



# Stevensville Village

- **Assessment of Hickory Creek and Local Ponds by FTC&H**
- **Stream Clean-Ups**
- **Desire to work together to improve water quality and habitat!**

# What Can We Do?

- Watershed Management
  - identifying and prioritizing problems
  - involving stakeholders
  - developing solutions
  - measuring success
- Better agricultural practices (MSUE, Conservation Districts)
- Better practices at home (see flyers)
- **Better development**
- **Better planning and zoning techniques**





# Better Development

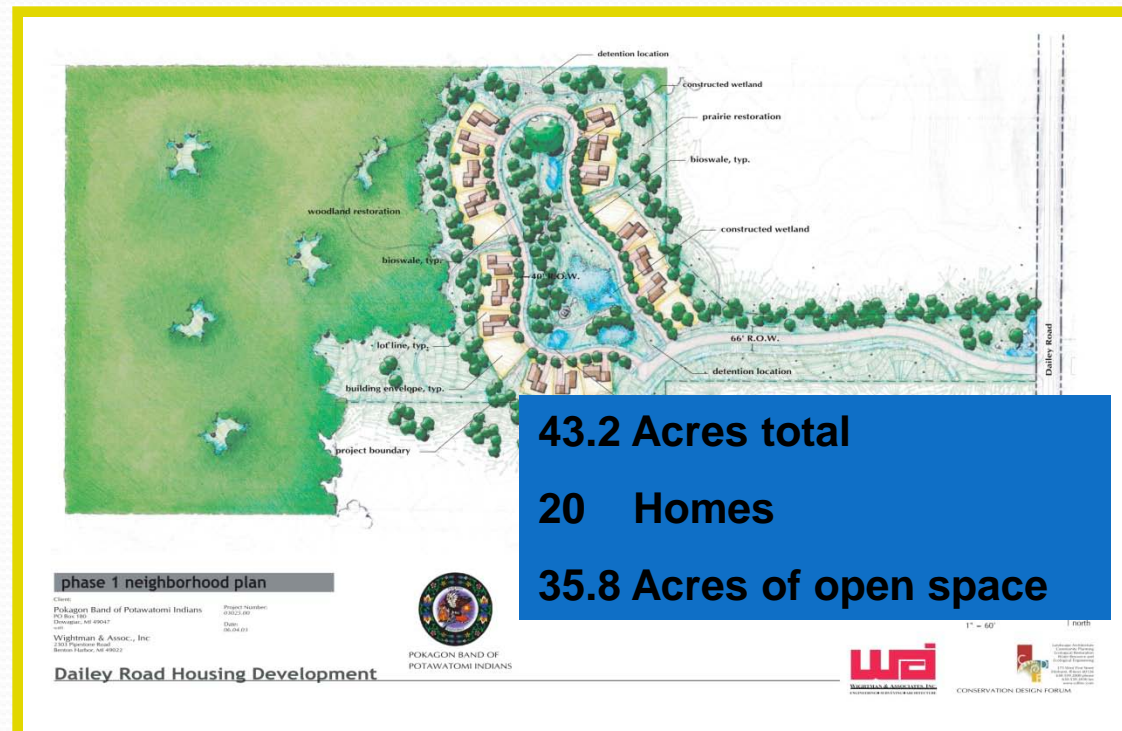
**WATER - SLOW IT DOWN – SPREAD IT OUT - SOAK IT IN**

- Low Impact Development - Protect existing hydrology of a site
- Promote open space preservation and natural resource protection

Figure B  
Cluster Design



[www.swmpc.org/lid.asp](http://www.swmpc.org/lid.asp)





Welcome to your natural habitat.



## Longmeadow, a residential & commercial development



Southeast corner of US31  
(exit 5) and Niles Buchanan  
Road, Niles Township





INFORMATION CENTER	THE VILLA'S AT LONGMEADOW SECTION TWO
COMMERCIAL	LAKE
COPORATE VILLAGE AT LONGMEADOW	ICE SKATING POND
PARK	COMMUNITY GARDEN
PAVEMENT	TREE HOUSE
RESERVED OPEN SPACE	SLEDDING HILL
RESIDENTIAL	TREES
THE PINES AT LONGMEADOW	BIRD SANCTUARY
BRIDLE PATH	PAVEMENT
WOODED RIDGE	RESERVED OPEN SPACE
THE ESTATES AT LONGMEADOW SECTION	ILLUMINATED 180 YEAR OLD OAK TREE
THE ESTATES AT LONGMEADOW SECTION	

"Save It, Don't Pave It"  
philosophy

**Clustered homes and preserved open space**

Enhancement and extensive **buffering of wetlands/ponds**

**Decreased number, length and width of roads** with site design

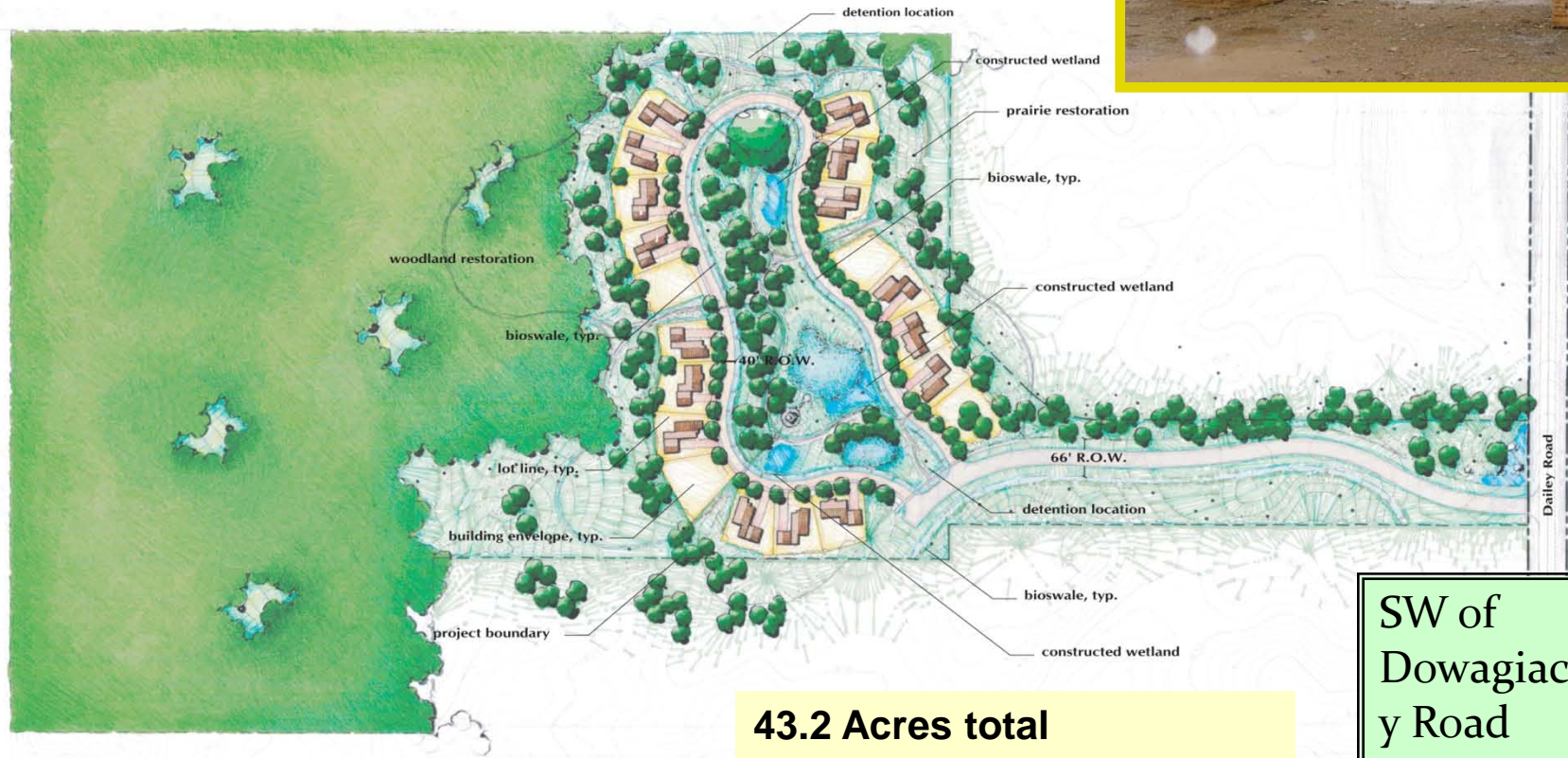
**Grass swales/open channels** to instead of curb and gutter, where feasible

**Native vegetation** plantings used for stormwater treatment and filtration; and

Sand and **pretreatment filter systems** for commercial parking areas



# Pokagon Band Development



## phase 1 neighborhood plan

Client:  
Pokagon Band of Potawatomi Indians  
PO Box 180  
Dowagiac, MI 49047  
web

Project Number:  
03025.00  
Date:  
06.04.03



POKAGON BAND OF  
POTAWATOMI INDIANS

Wightman & Assoc., Inc.  
2303 Pipestone Road  
Benton Harbor, MI 49022

## Dailey Road Housing Development

**43.2 Acres total**

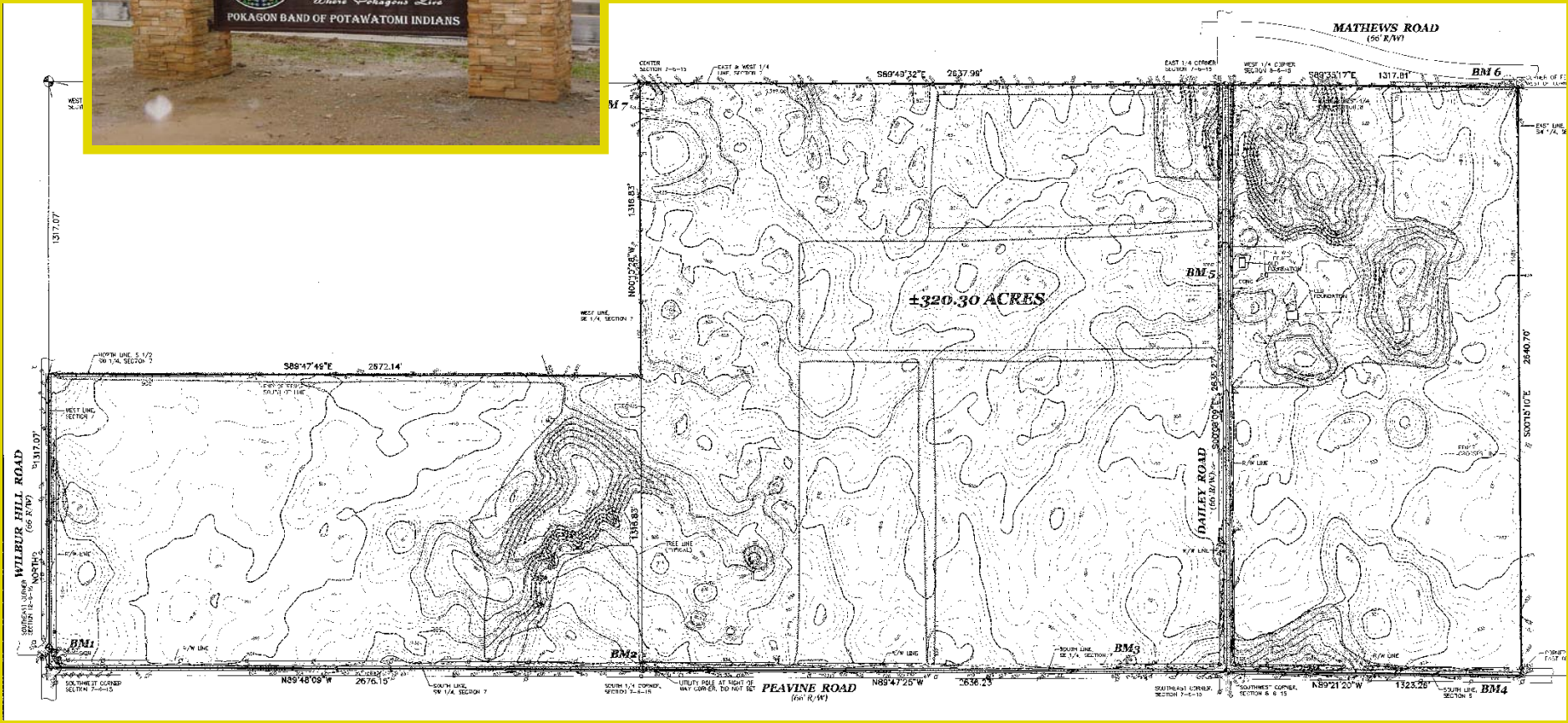
**17 Homes**

**35.8 Acres of open space**

SW of  
Dowagiac, Dailey  
Road



CON keep it BLUE



## Inventory of site

- Wetlands
- Trees and plants
- Soils
- Natural landform features





## The Pokagon Development

- Minimized impervious areas
- Maximized infiltration & groundwater recharge



## LID Techniques

Narrow/porous roads

No curb and gutter

Porous trail surfaces

Efficient floor plans

Native plants/  
grasses

Bioswales/rain  
gardens

Preserved open  
space



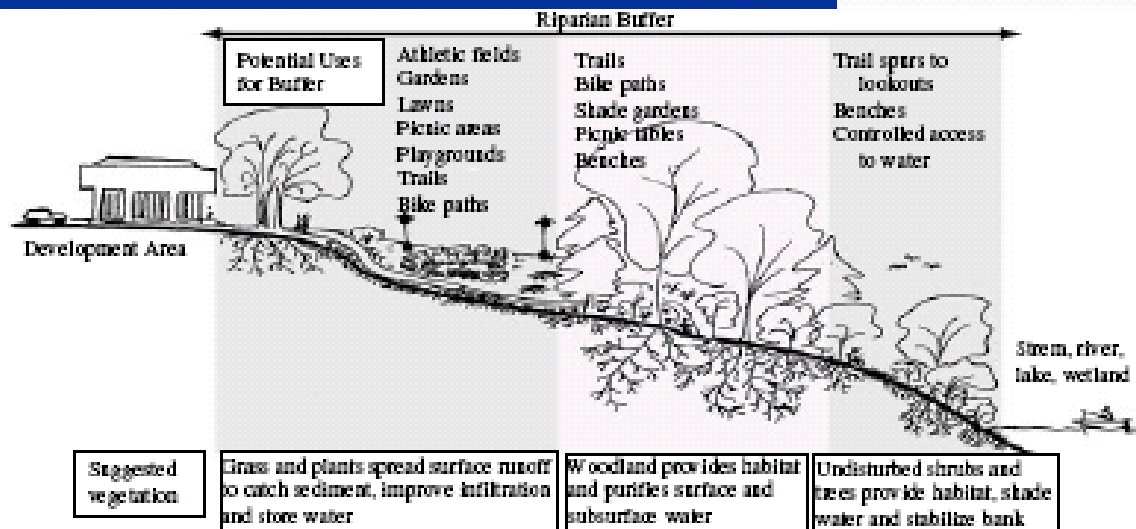




# The City of Watervliet Is Stormwater Savvy



**1. Porous Pavement**



**2. Riparian Buffer**



**3. Rain Garden**

Watervliet - M-140 at the Paw Paw River - Veteran's Park



Educational signs



Porous pavement parking lot



Rain garden with river buffer  
in background



# Zoning Ordinance Site Plan Review

- **Require** identification of existing natural features
- **Restrict** removal or alteration of significant natural features (forested areas, wetlands, etc)
- **Preserve** topography and protect areas (swales, wetlands, ponds) to preserve drainage patterns
- **Require** the use of LID to maintain hydrology to extent possible

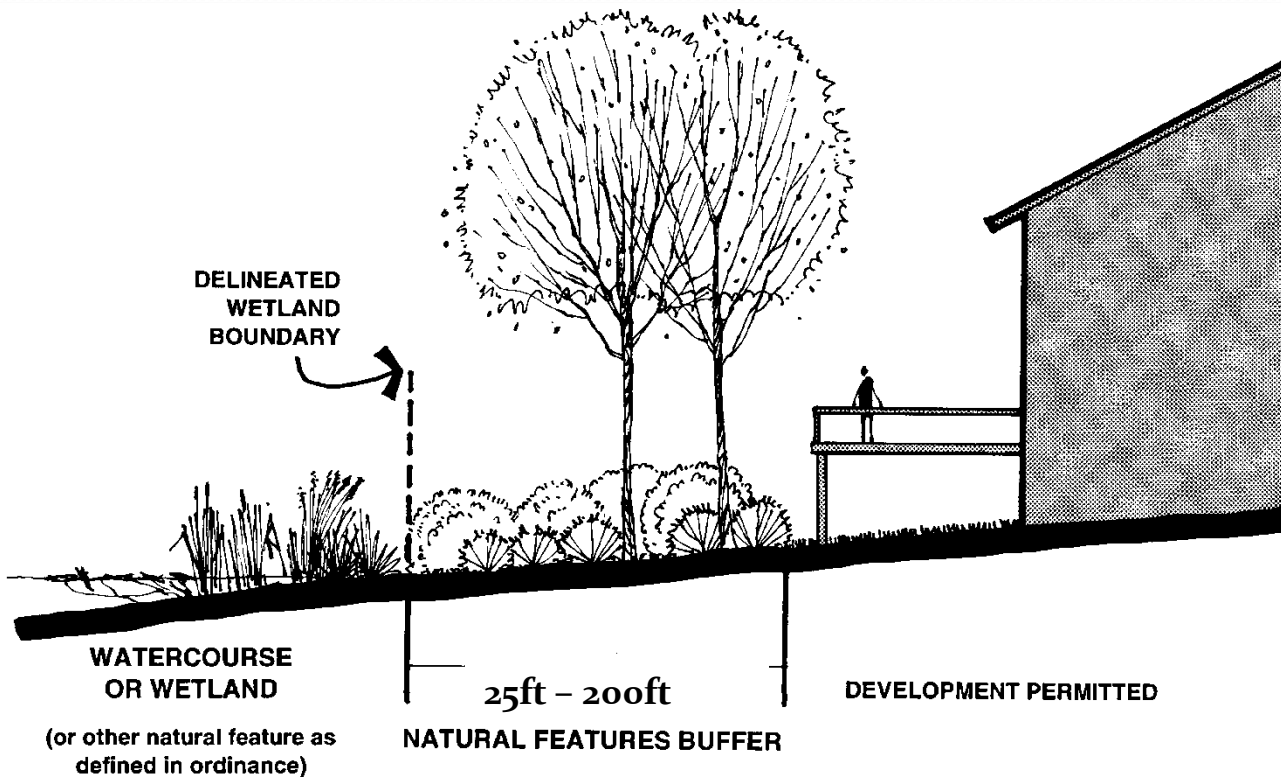




- The site plan shall show all structural best management practices to be utilized on the site.
- In addition, a description of any non-structural best management practices which will be utilized should be submitted with the site plan. The applicant can refer to the *Low Impact Development Manual for Michigan: A Design Guide for Implementers and Reviewers*, SEMCOG 2008, for detailed information on Low Impact Development and the best management practices listed below.
- 1. The nonstructural Best Management Practices (BMPs) are:
  - Cluster development
  - Minimize soil compaction
  - Minimize total disturbed area
  - Protect natural flow pathways Protect riparian buffers
  - Protect sensitive areas Reduce impervious surfaces Stormwater disconnection 2.
- The structural Best Management Practices (BMPs) are:
  - Bioretention (Rain Gardens)
  - Capture Reuse
  - Constructed Filter
  - Detention Basins
  - Infiltration Practices
  - Level Spreaders
  - Native Revegetation
  - Pervious Pavement with Infiltration
  - Planter Boxes
  - Riparian Buffer Restoration
  - Soil Restoration
  - Vegetated Filter Strip
  - Vegetated Roof Vegetated
  - Water Quality Devices

# Zoning Ordinance

## Water/wetland setbacks the last line of defense



**Over 60% of  
water pollution  
comes from  
runoff**

### Waterfront and Wetland Water Quality Setbacks Setback from shoreline or edge of wetland.

All waterfront lots or lots containing wetlands shall maintain a minimum setback for any permanent structure (dwelling unit, other principal building or an accessory building) from the ordinary high water mark and/or delineated wetland boundary as follows, which may be in excess of the minimum requirements of this Ordinance. Any person proposing to erect, install, move, or enlarge a permanent structure on a waterfront lot or lot containing a wetland is required to satisfy these minimum standards unless a greater setback is otherwise required elsewhere in this Ordinance:

1. Fifty (50) feet from the ordinary high water mark of an inland lake, river, stream, creek, or other watercourse.
2. Fifty (50) feet from the boundary or edge of a wetland, which is designated on the Township wetland map, as delineated on a professionally prepared survey completed by a certified professional submitted to Township and reviewed by Township staff, Michigan DEQ, and/or other professionals, as required.

# Zoning Ordinance



Figure B  
Cluster Design



**Provide Incentives – Open Space Developments**  
(bonus density in exchange for open space)






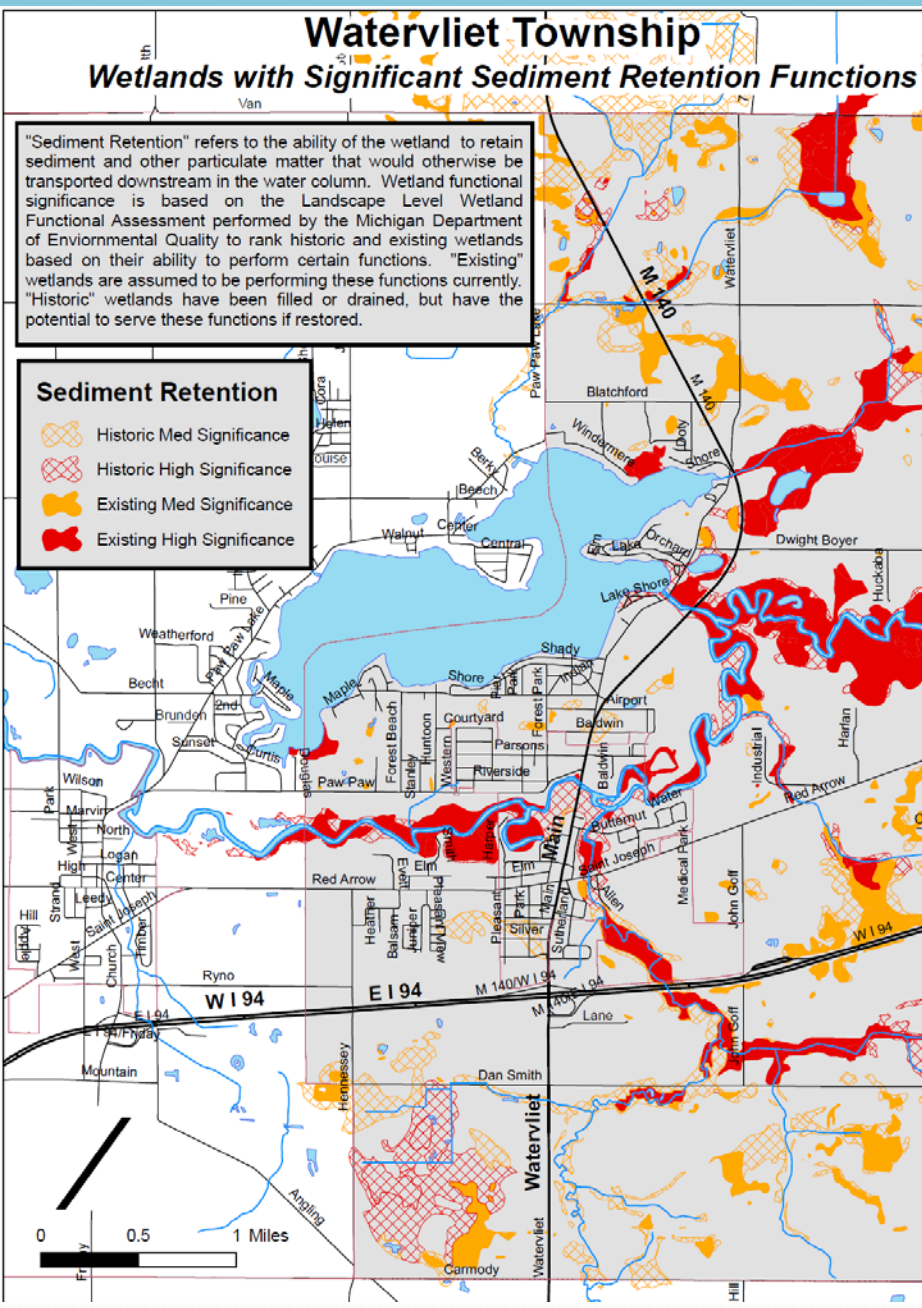
# Watervliet Township

## Wetlands with Significant Sediment Retention Functions

"Sediment Retention" refers to the ability of the wetland to retain sediment and other particulate matter that would otherwise be transported downstream in the water column. Wetland functional significance is based on the Landscape Level Wetland Functional Assessment performed by the Michigan Department of Environmental Quality to rank historic and existing wetlands based on their ability to perform certain functions. "Existing" wetlands are assumed to be performing these functions currently. "Historic" wetlands have been filled or drained, but have the potential to serve these functions if restored.

### Sediment Retention

-  Historic Med Significance
-  Historic High Significance
-  Existing Med Significance
-  Existing High Significance






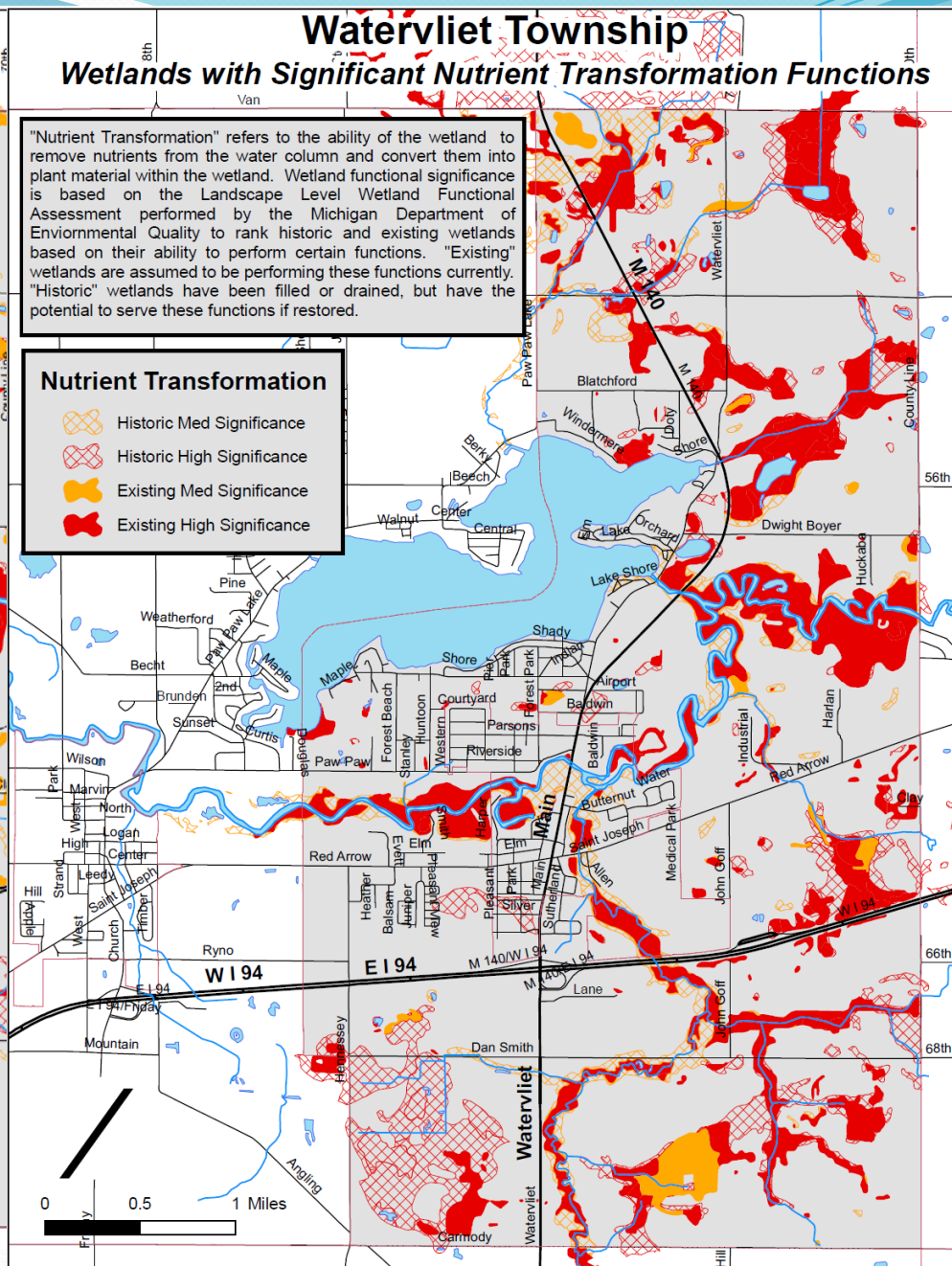
# Watervliet Township

## Wetlands with Significant Nutrient Transformation Functions

"Nutrient Transformation" refers to the ability of the wetland to remove nutrients from the water column and convert them into plant material within the wetland. Wetland functional significance is based on the Landscape Level Wetland Functional Assessment performed by the Michigan Department of Environmental Quality to rank historic and existing wetlands based on their ability to perform certain functions. "Existing" wetlands are assumed to be performing these functions currently. "Historic" wetlands have been filled or drained, but have the potential to serve these functions if restored.

### Nutrient Transformation

-  Historic Med Significance
-  Historic High Significance
-  Existing Med Significance
-  Existing High Significance



# Do Your Part!

- ☛ We are blessed with a wonderful creek.
- ☛ We all need to do our part!
- ☛ There is an opportunity to develop in a manner that will protect water resources.
- ☛ **So, continue to learn and get involved to protect our water resources!**

