

Hickory Creek Watershed

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Southwest Michigan Planning Commission

Jack Houser

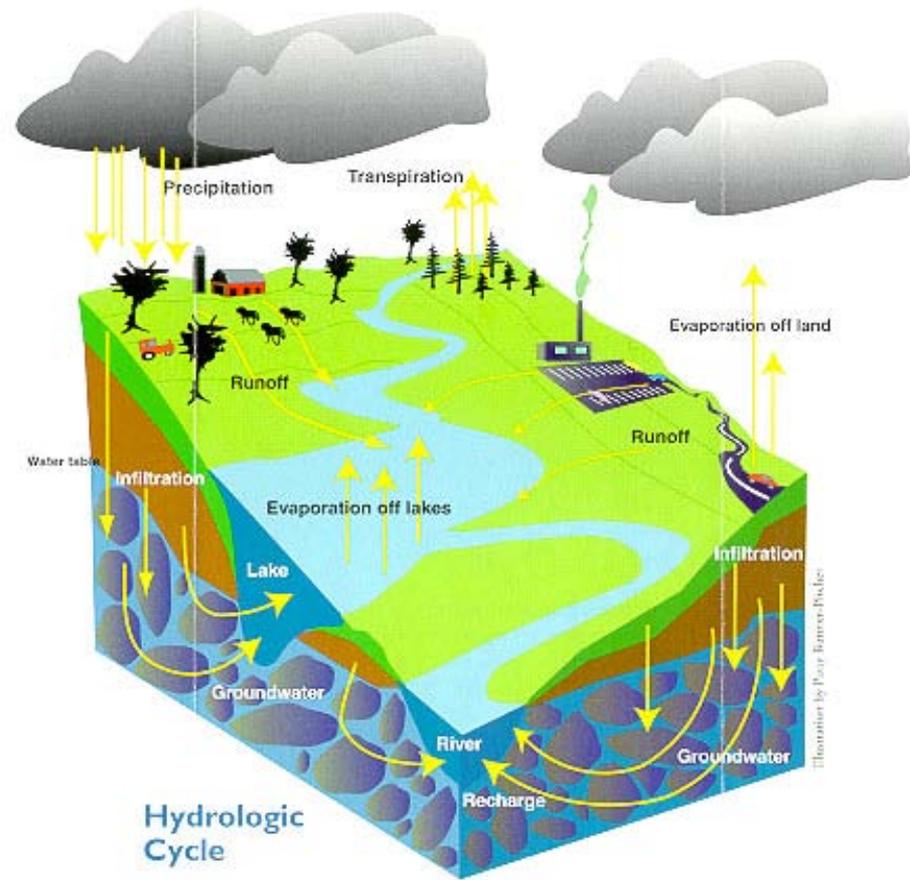
Village of Stevensville

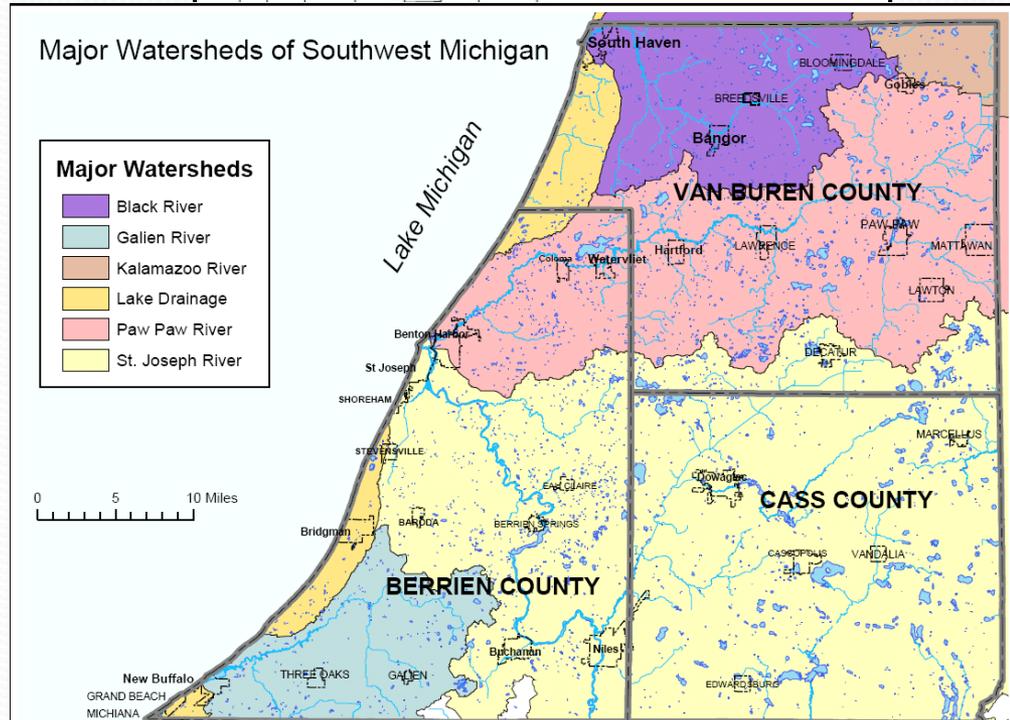
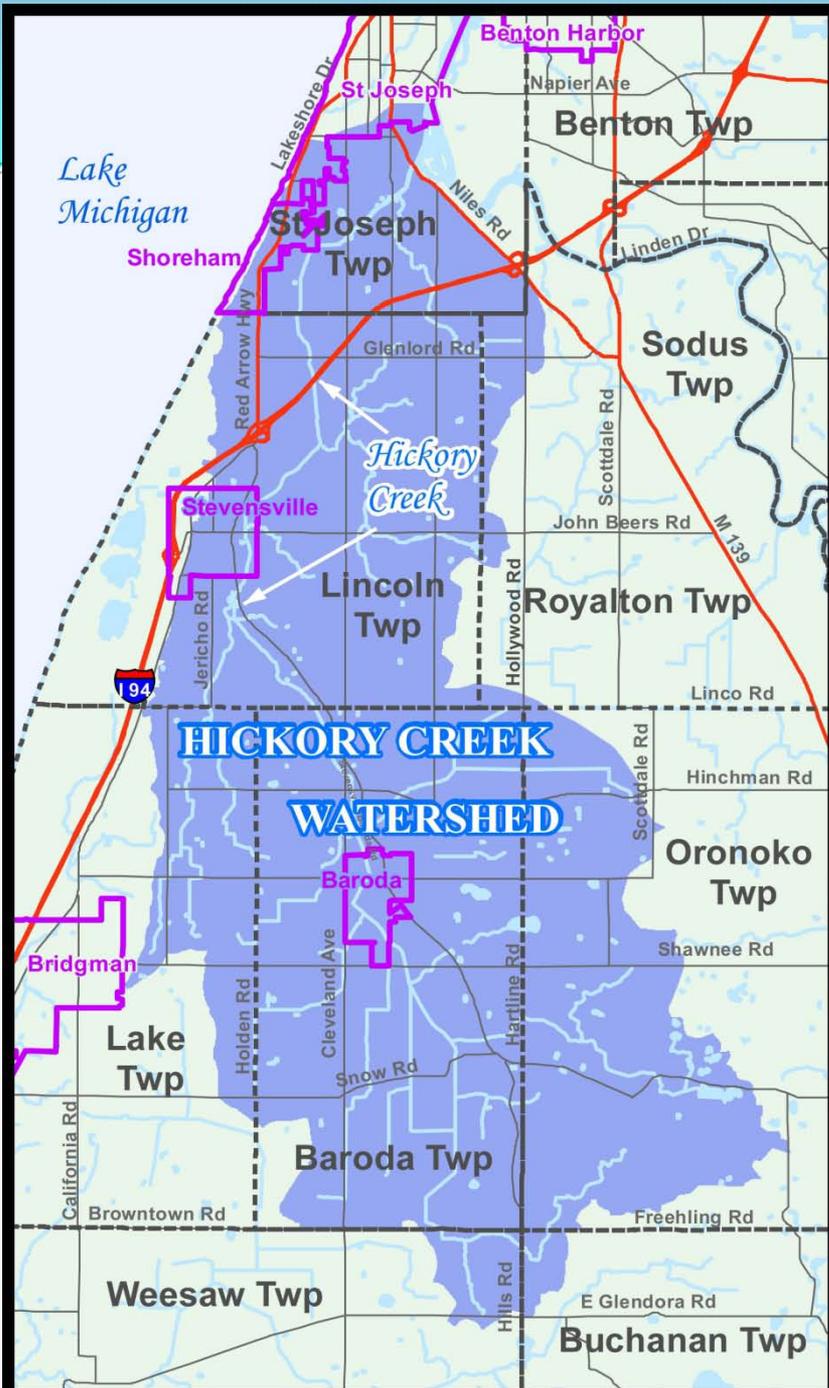


What is a Watershed?

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

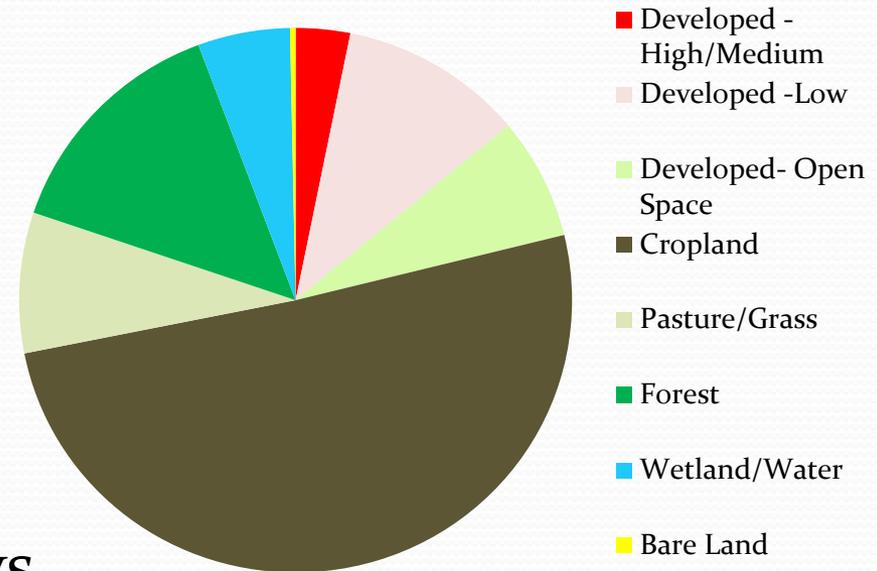
☞ A watershed crosses political boundaries connecting several municipalities by water.





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

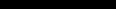
 Cultivated Crops

 Grassland/Pasture/Hay

 Open Water

Legend

 Hickory Creek Watershed

 Hydrology

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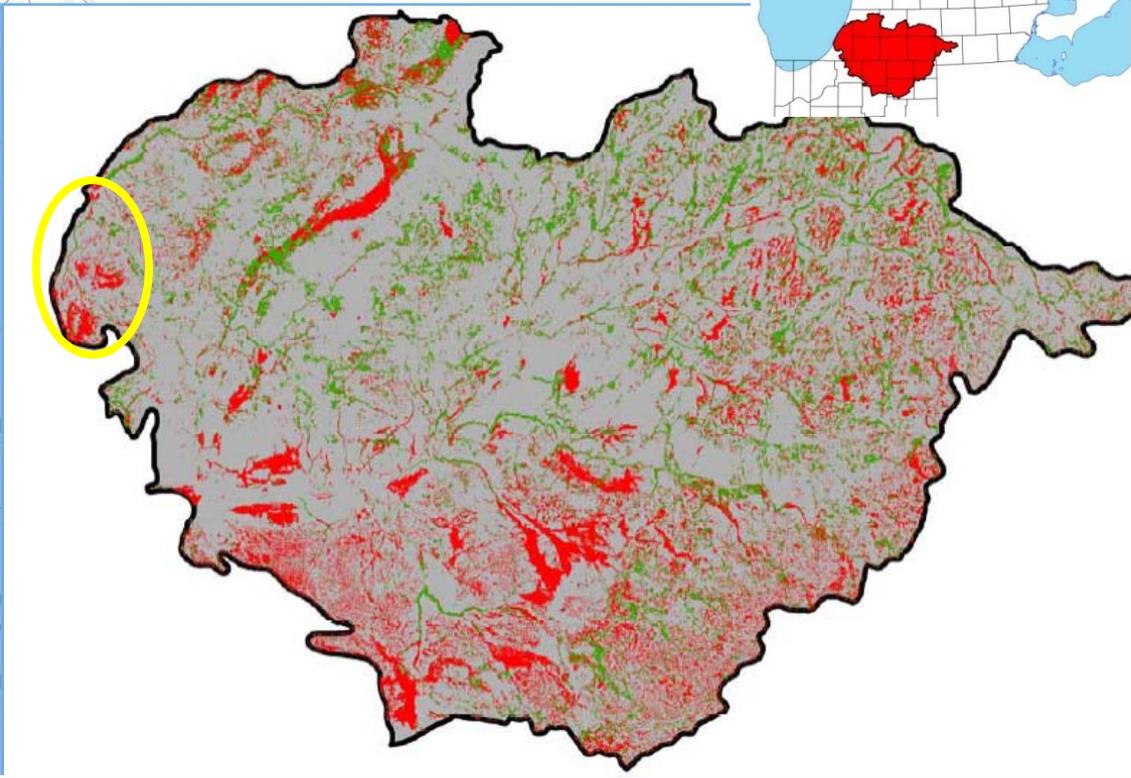
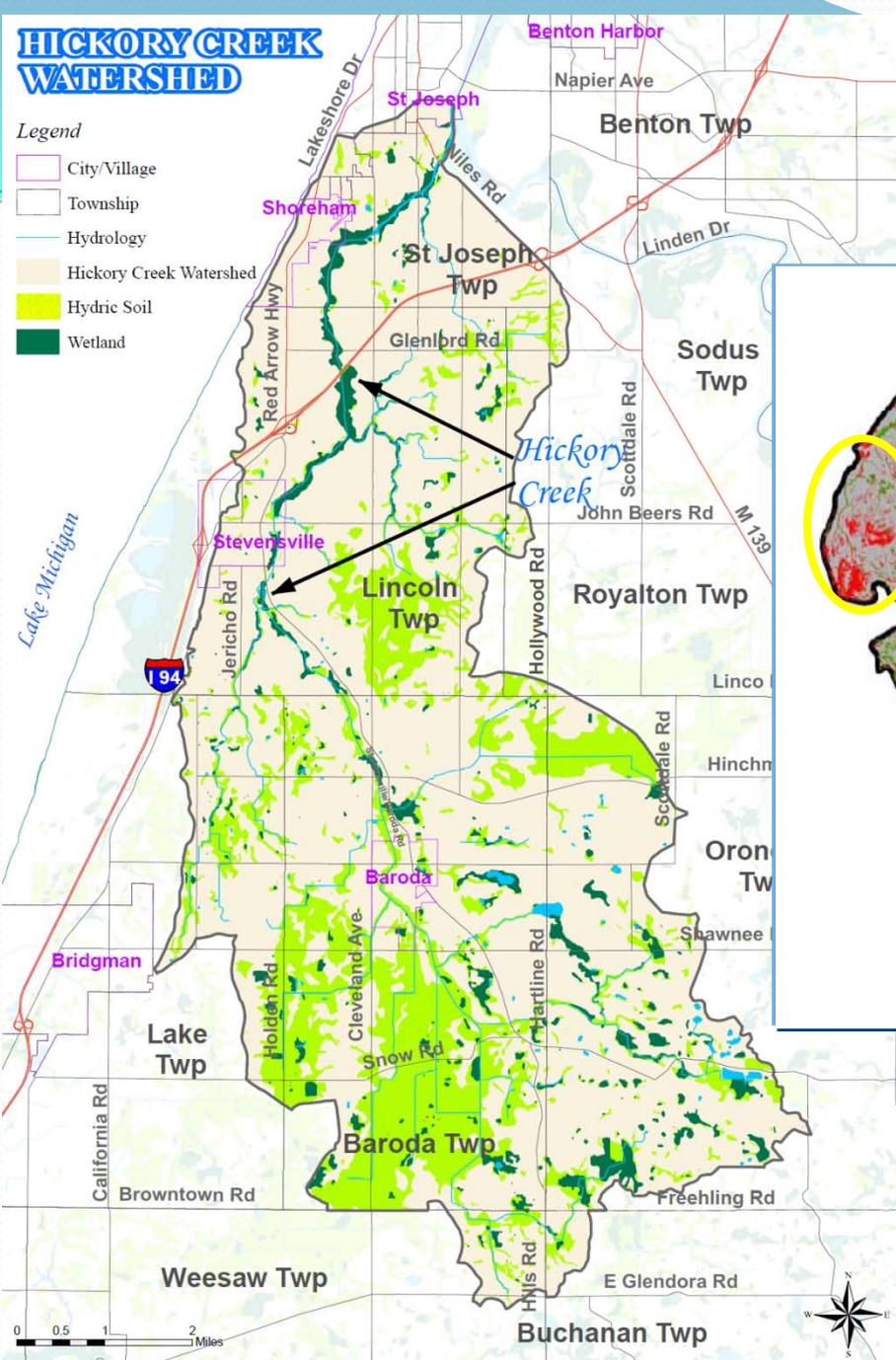
0 0.5 1 2 Miles



HICKORY CREEK WATERSHED

Legend

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



-  Wetland Lost
-  Wetland Existing

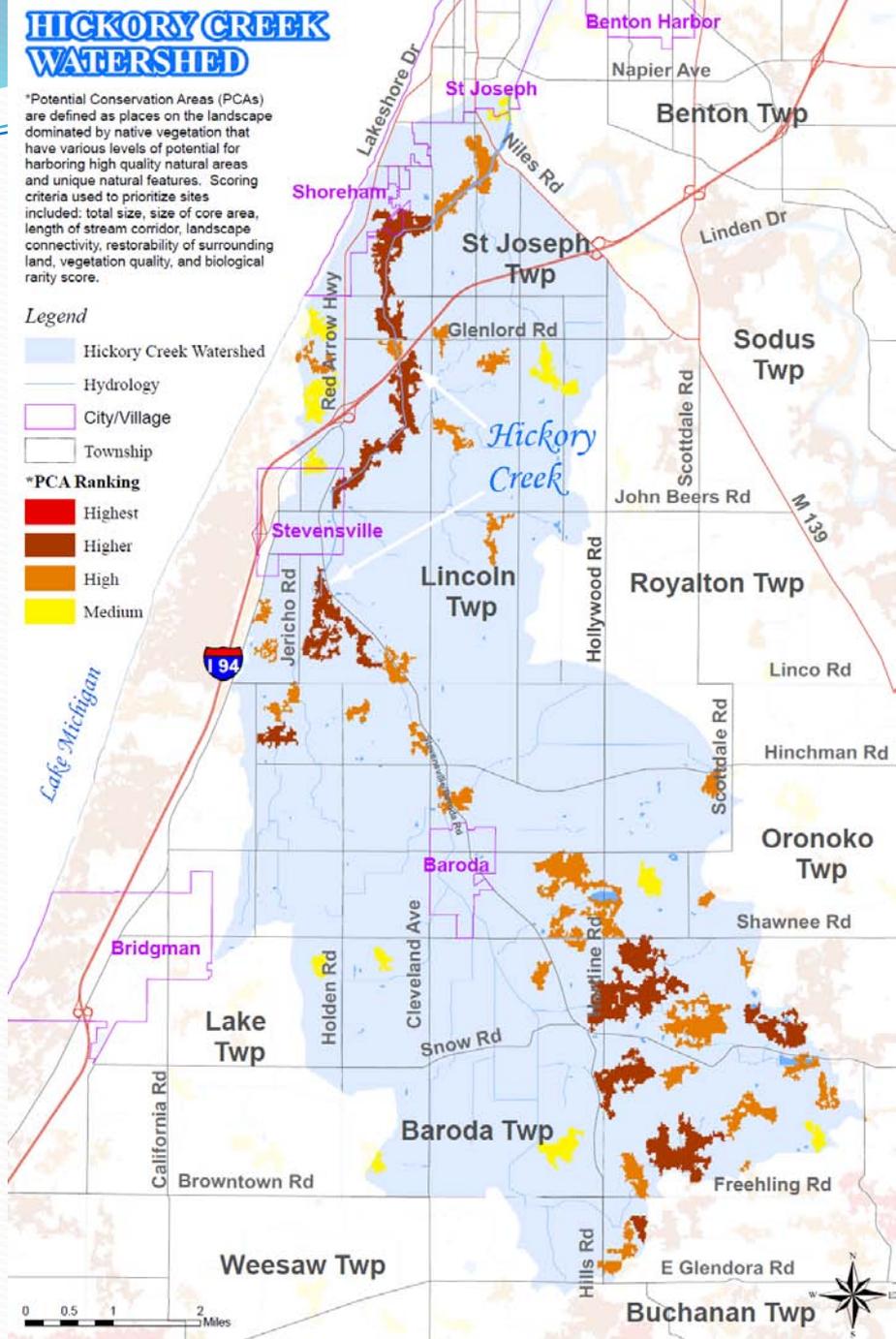


HICKORY CREEK WATERSHED

*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

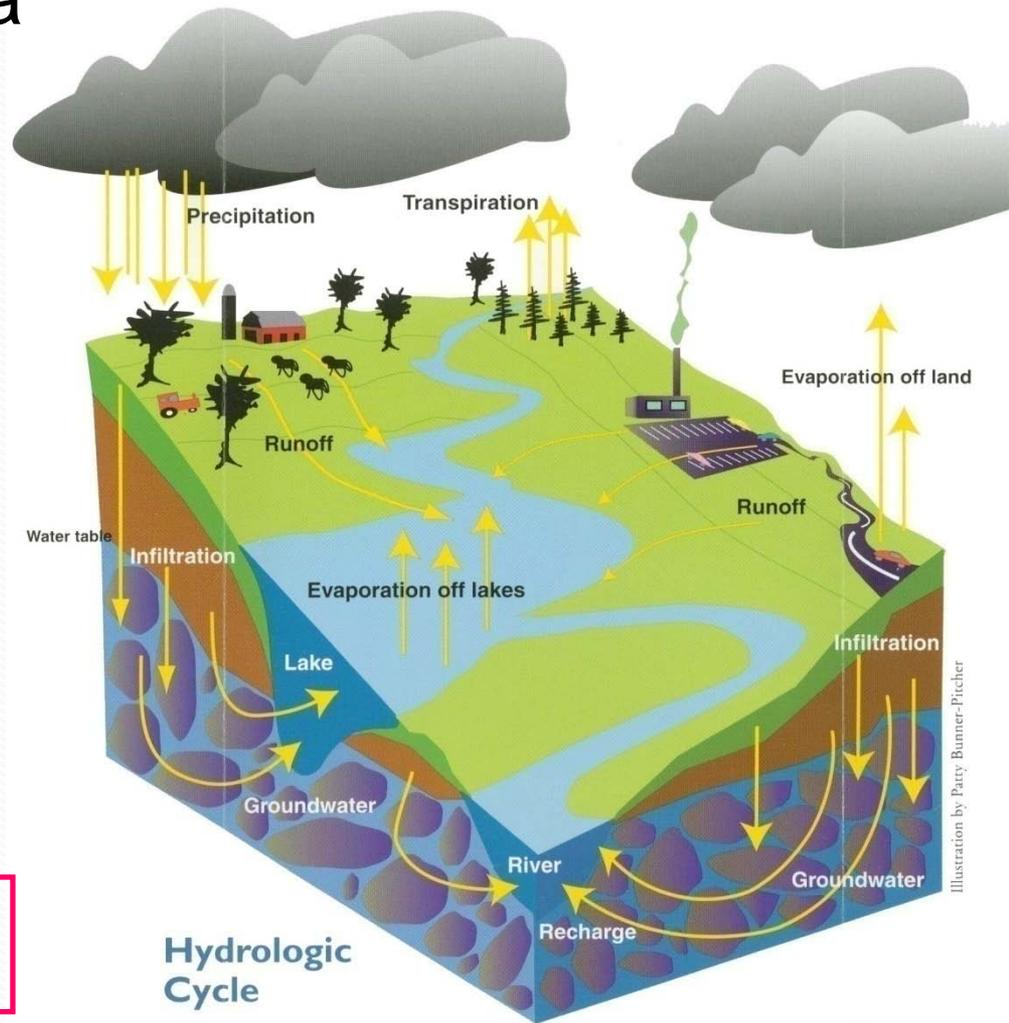


Two Types of Pollution

☛ **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.

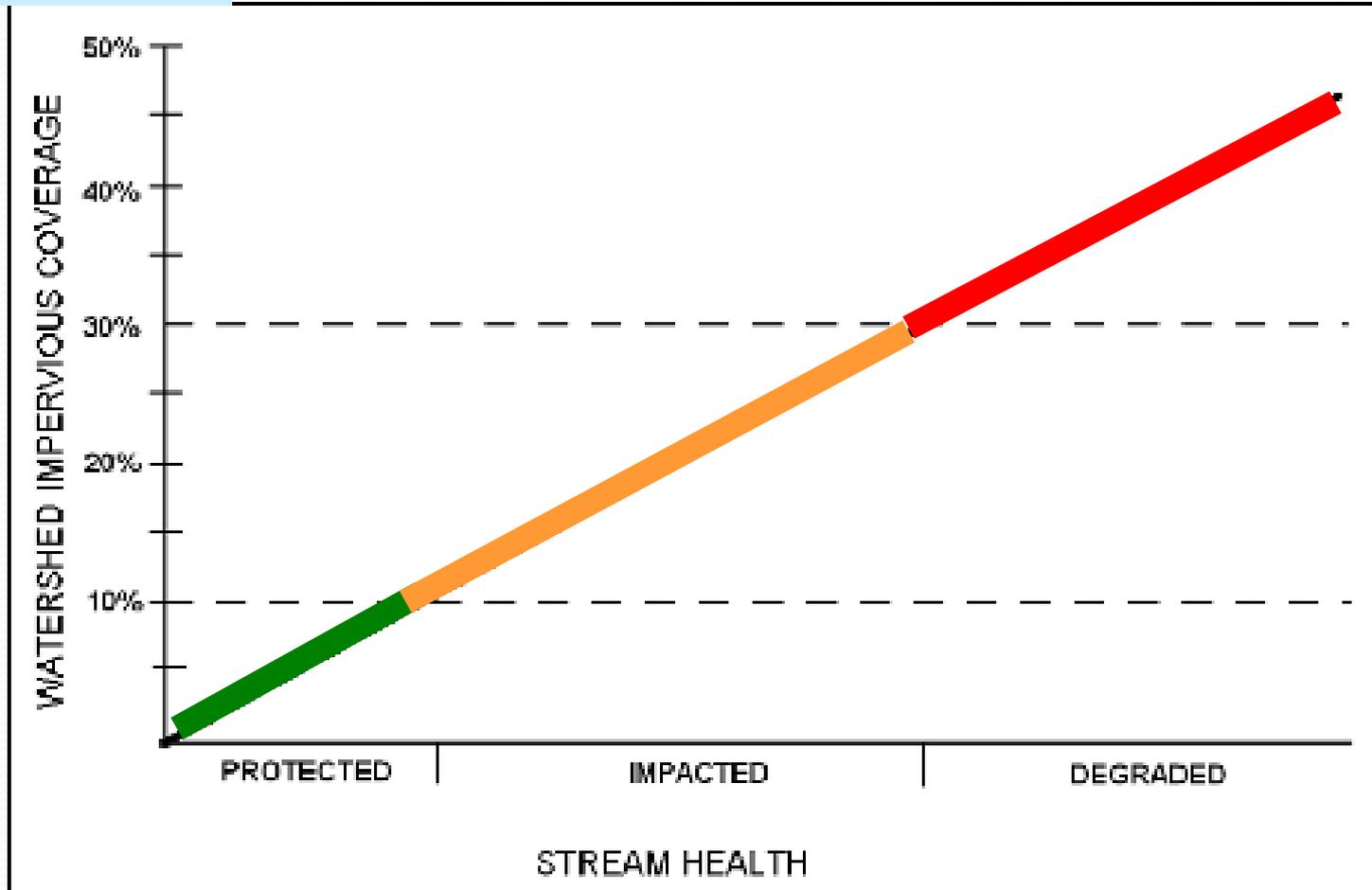
Increased impervious surfaces result in:

- ☞ 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

Relationship of Impervious Cover to Stream Health





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.

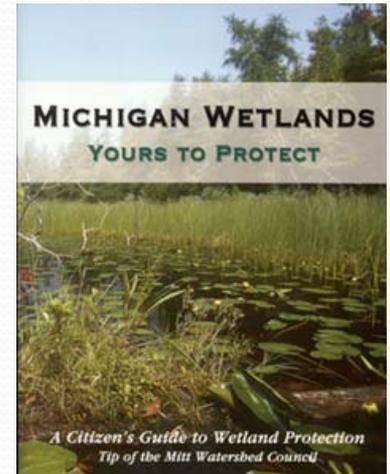


Stevensville Village

- **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**

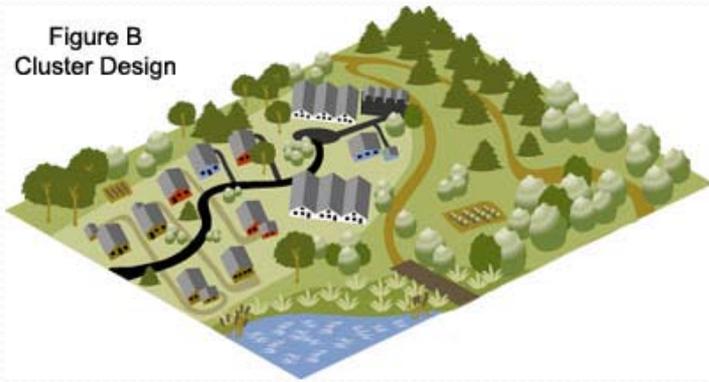


Better Development

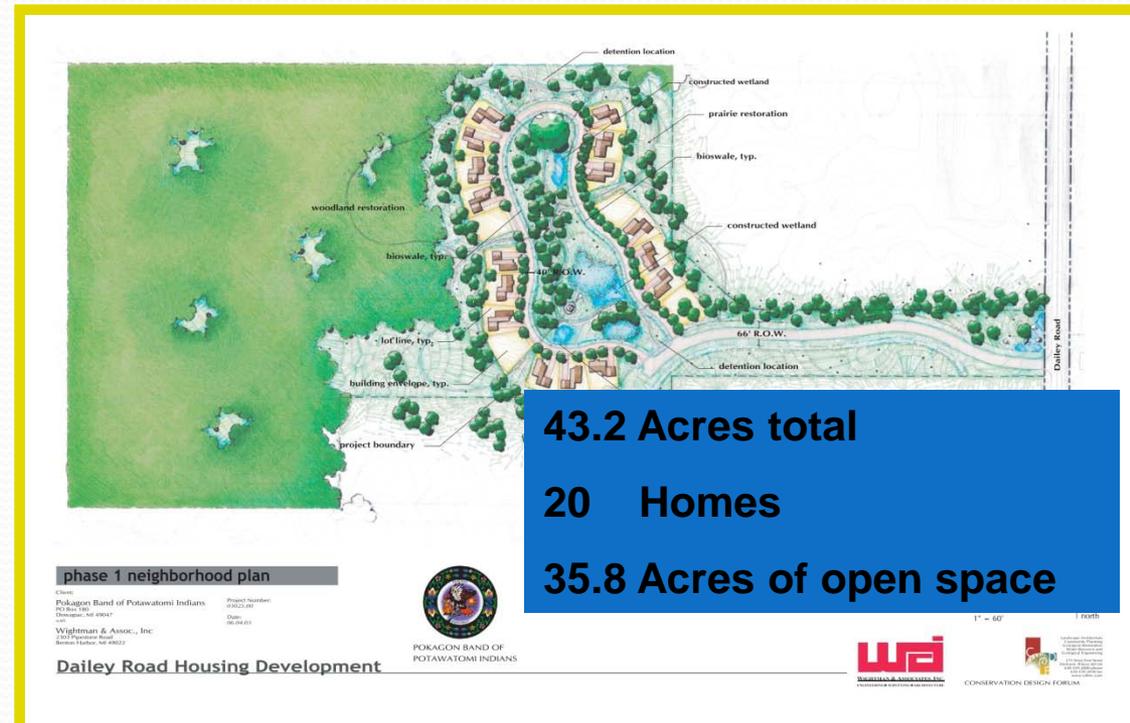
WATER - SLOW IT DOWN – SPREAD IT OUT - SOAK IT IN

- 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





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



SW of
Dowagiac, Dailey
Road

phase 1 neighborhood plan

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

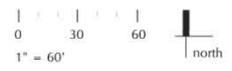
Project Number:
03025.00
Date:
06.04.03

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



POKAGON BAND OF
POTAWATOMI INDIANS

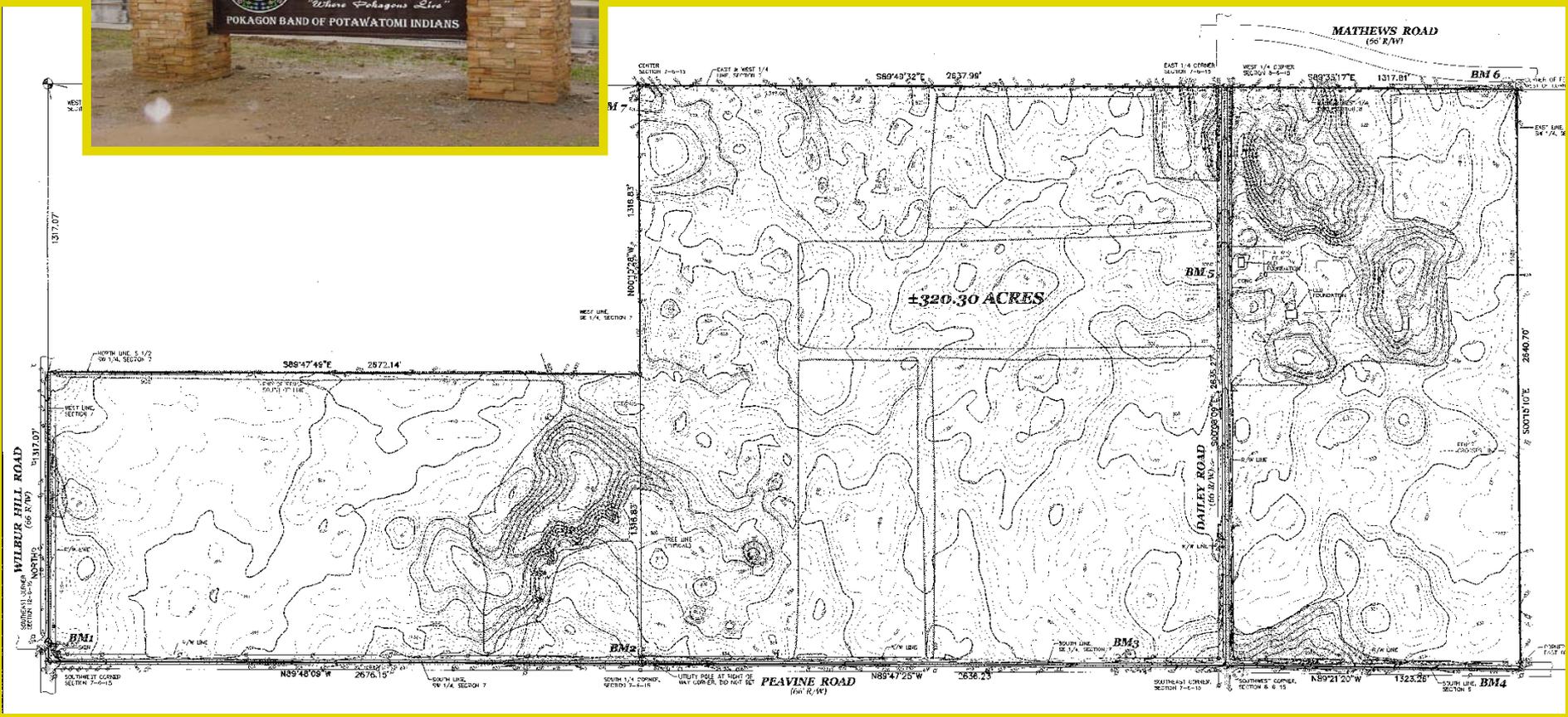
43.2 Acres total
17 Homes
35.8 Acres of open space



Dailey Road Housing Development



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

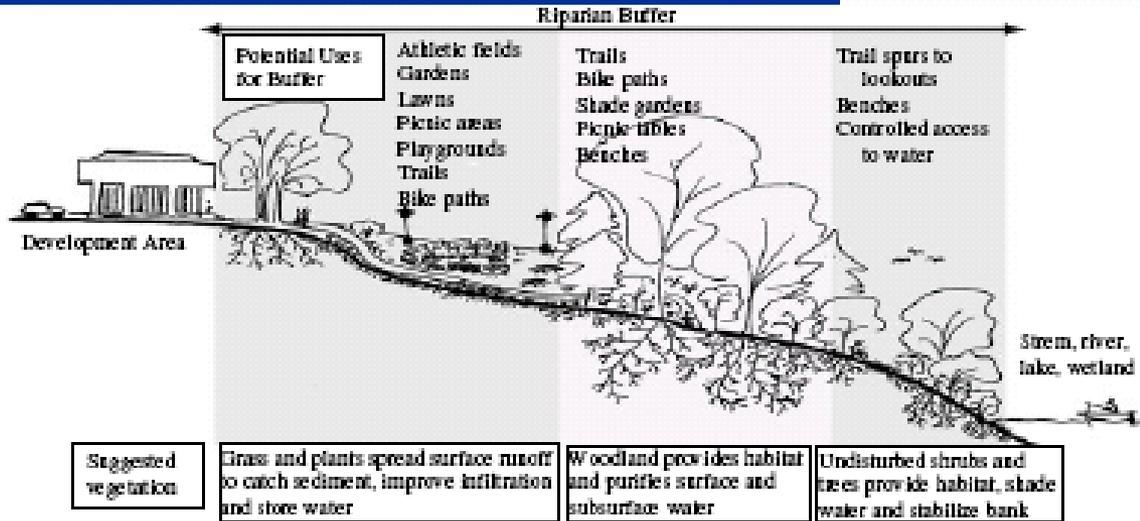
Preserved open
space



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



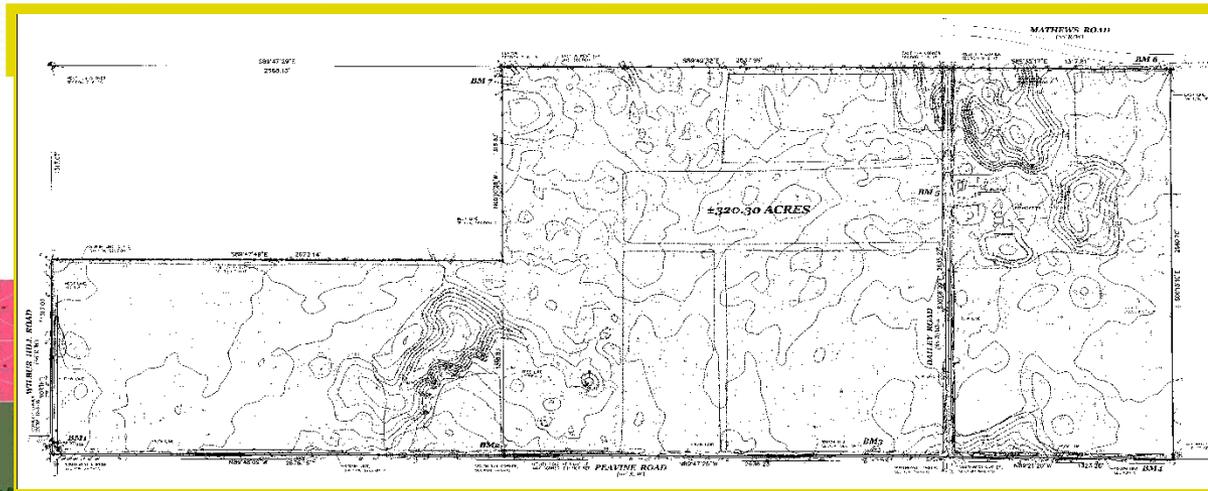
Porous pavement parking lot



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

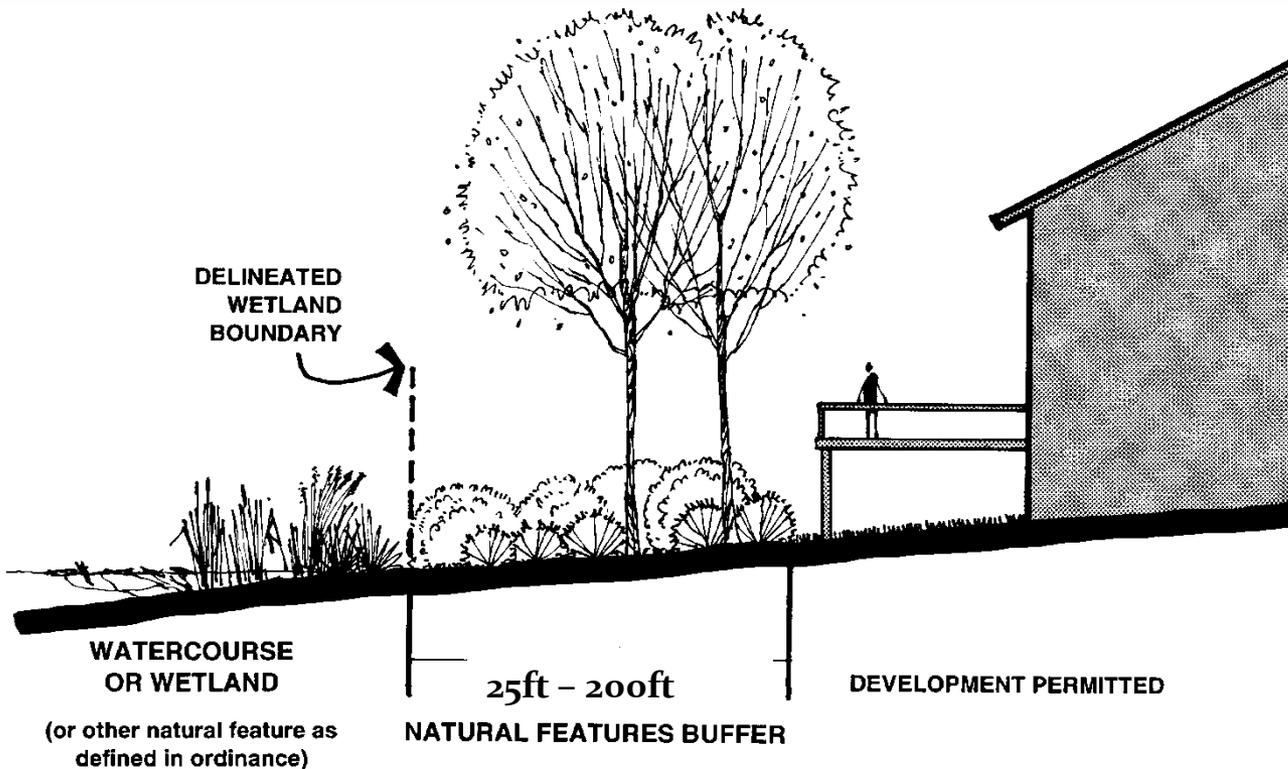


- The site plan shall show all structural best management practices to be utilized on the site.
- In addition, a description of any non-structural best management practices which will be utilized should be submitted with the site plan. The applicant can refer to the *Low Impact Development Manual for 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)

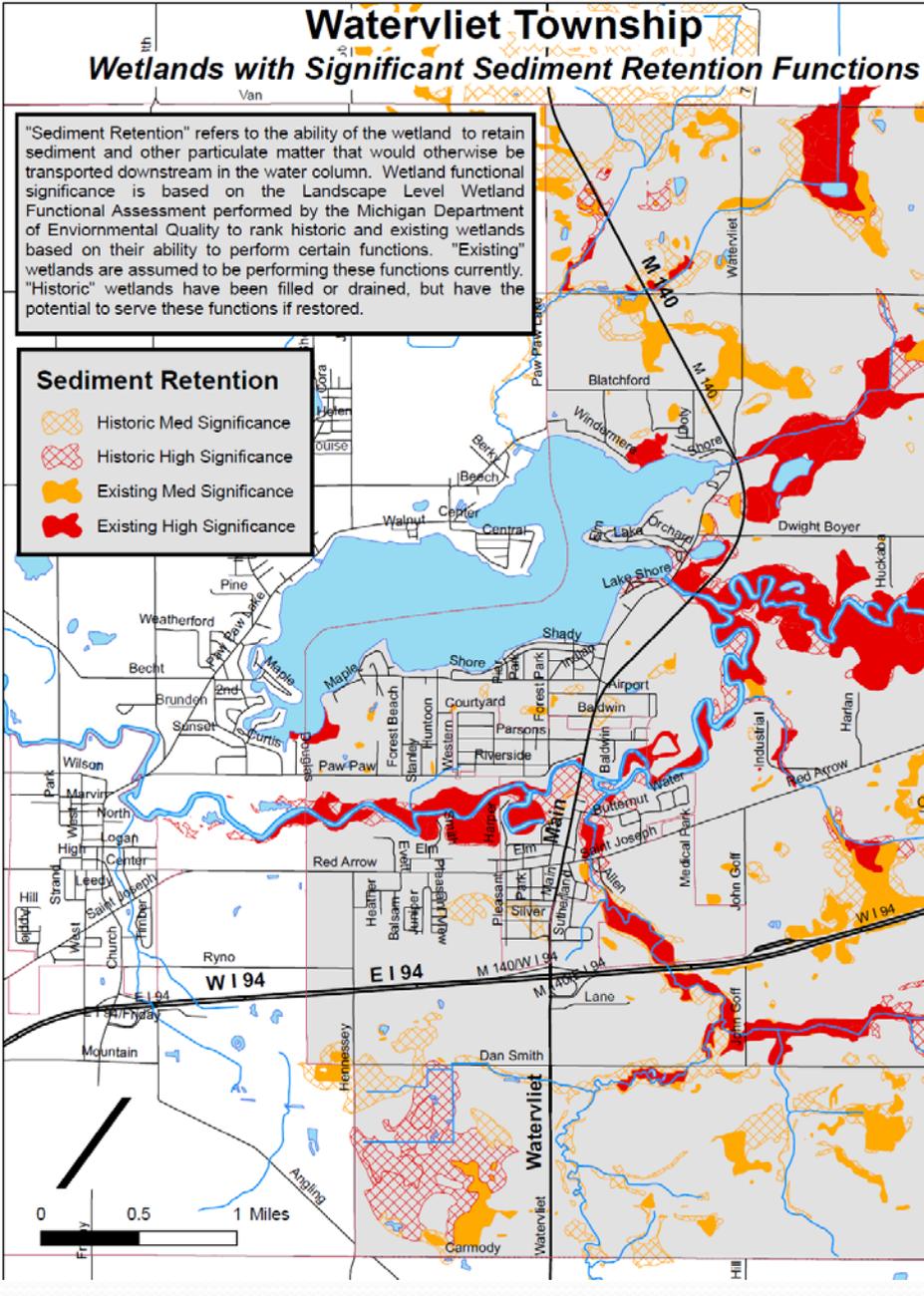
Watervliet Township

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



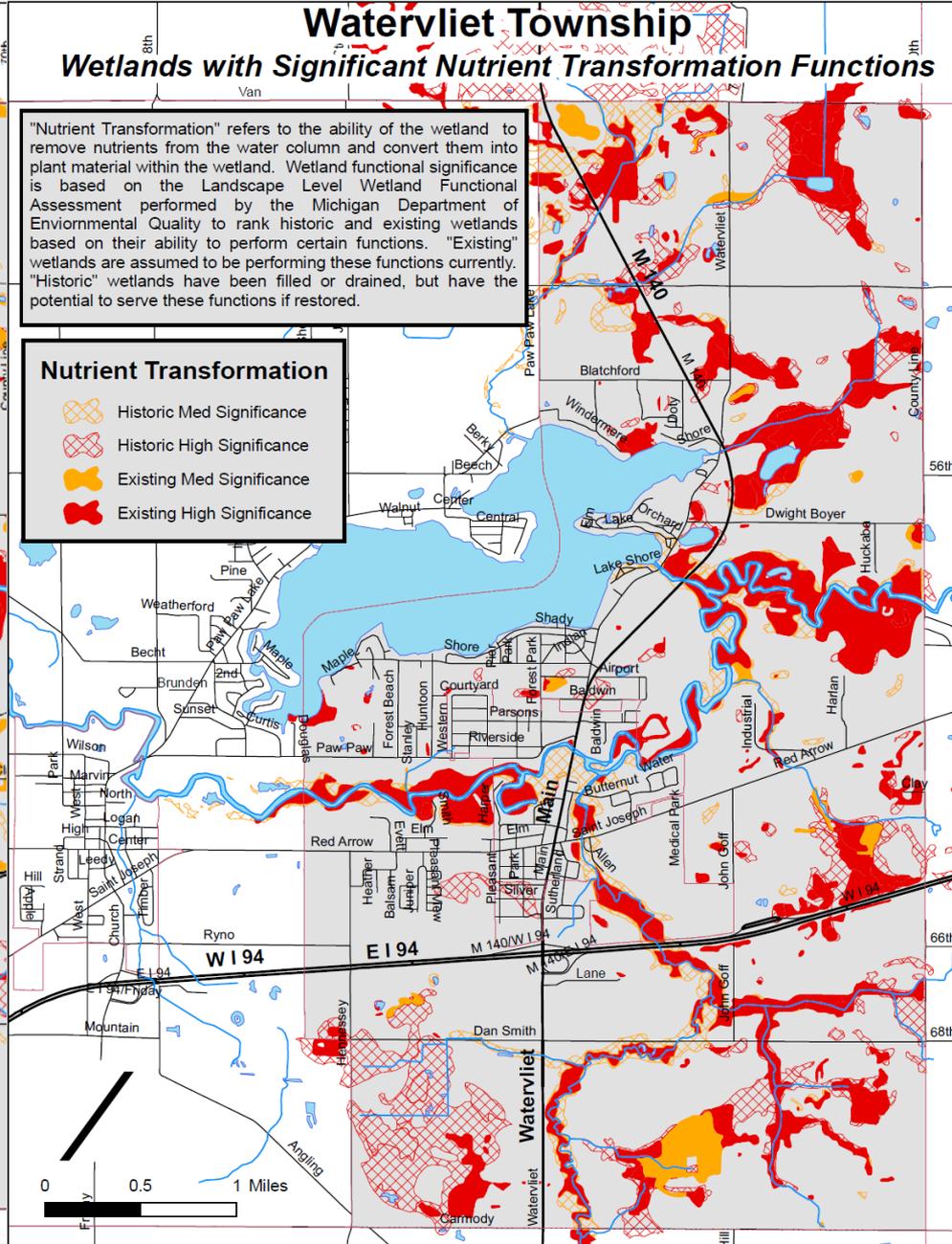
Watervliet Township

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!**

