



2008 Portage River Watershed Survey and TMDL Results

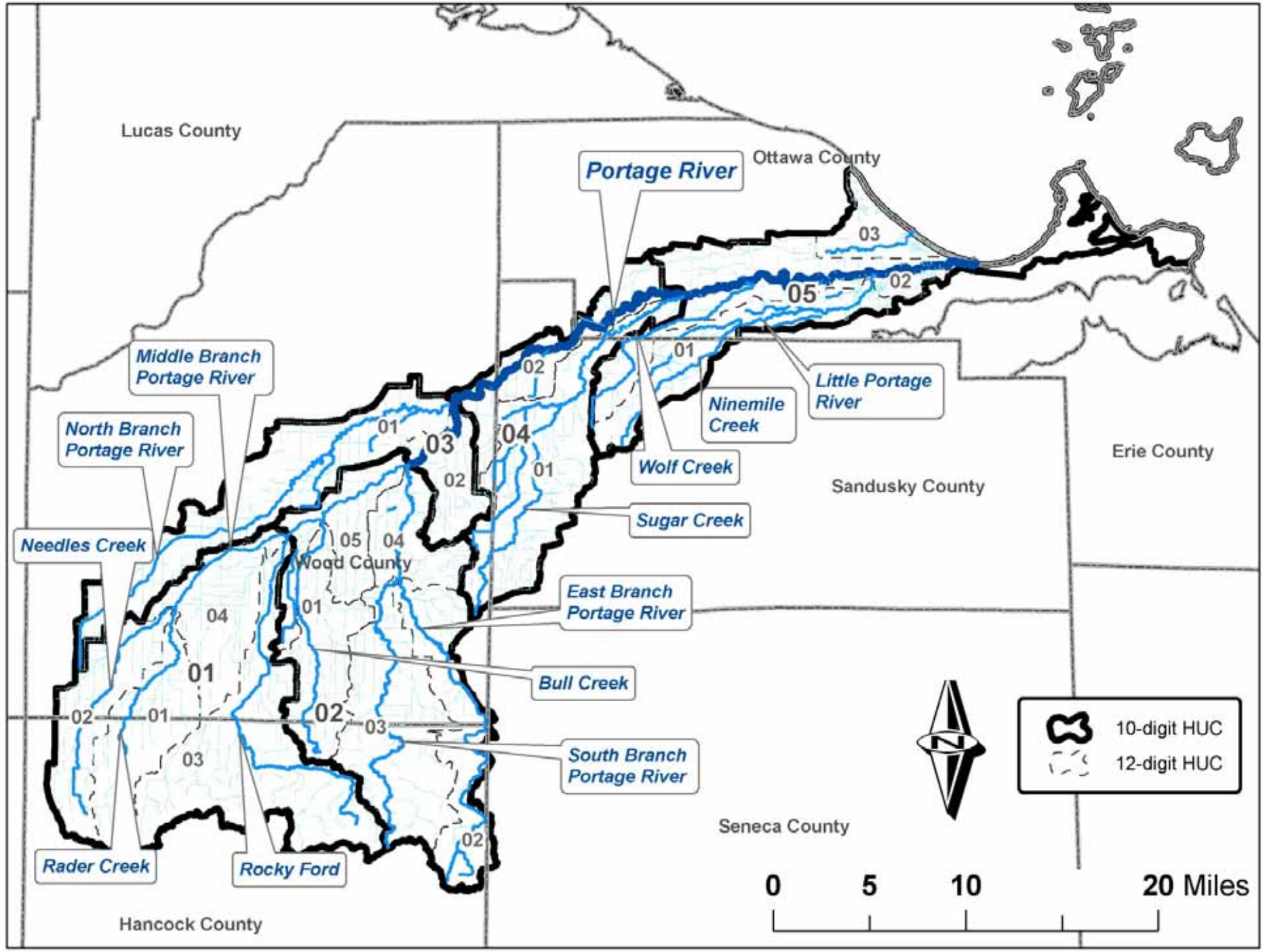
Ohio EPA

March 17, 2011

Wood County Health Department

Basic Overview

- Watershed = 585 square miles
- Streams = 1,401 miles
- Data collected in 2008
 - 68 aquatic life sites; 86 recreation sites
 - 20 stream miles per site (on average – headwaters have big impact on this statistic)
 - 8.6 square miles of drainage area per site (about 4 sites per assessment unit)





What are the Problems?

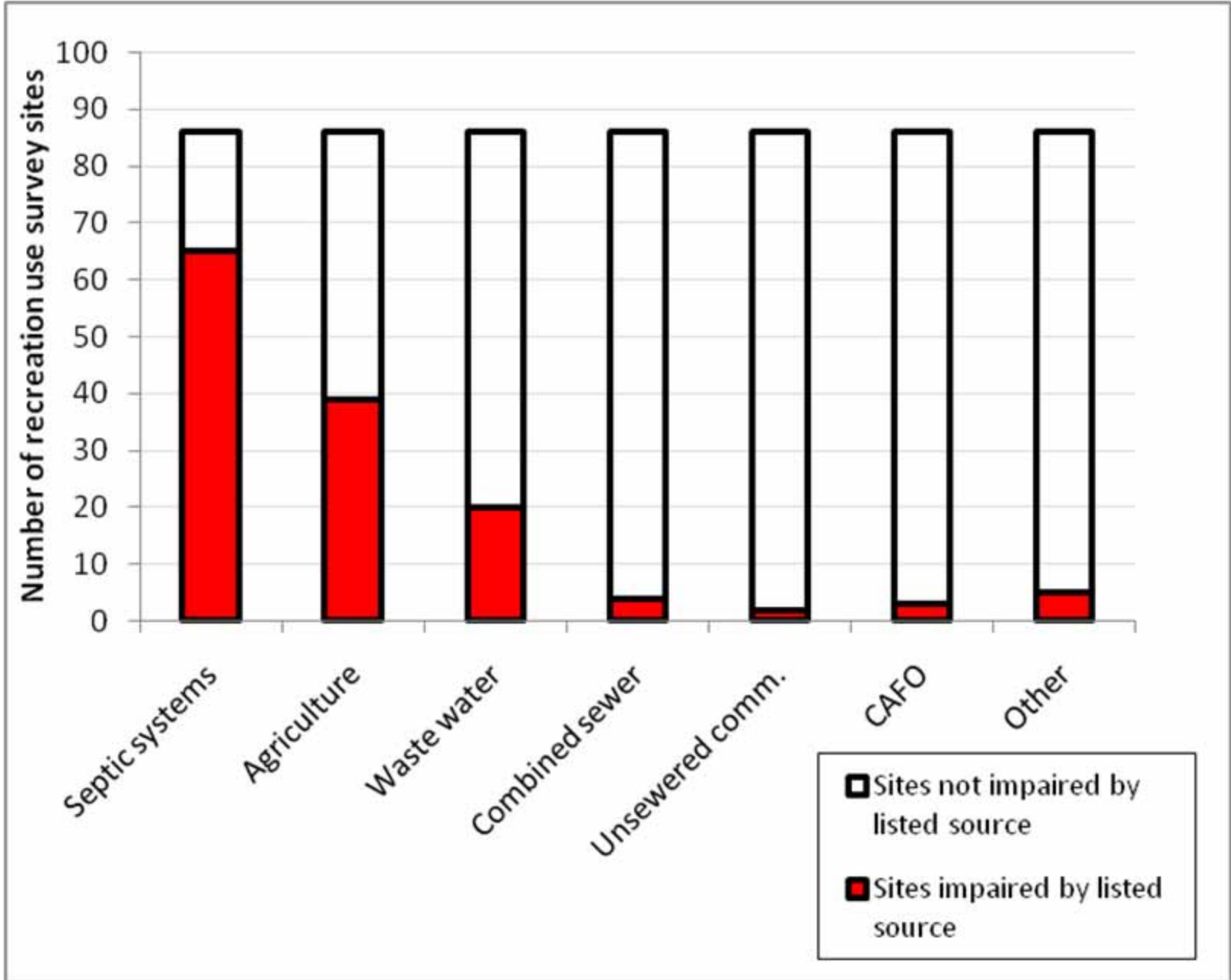
Causes

- **Sediment**
 - **35% OF ALL SITES**
- **Nutrients**
 - **18% OF ALL SITES**
- **Bacteria**
 - **88% OF ALL SITES**
- **Poor habitat**
 - **16% OF ALL SITES**
- **Low stream flow**
 - **12% OF ALL SITES**

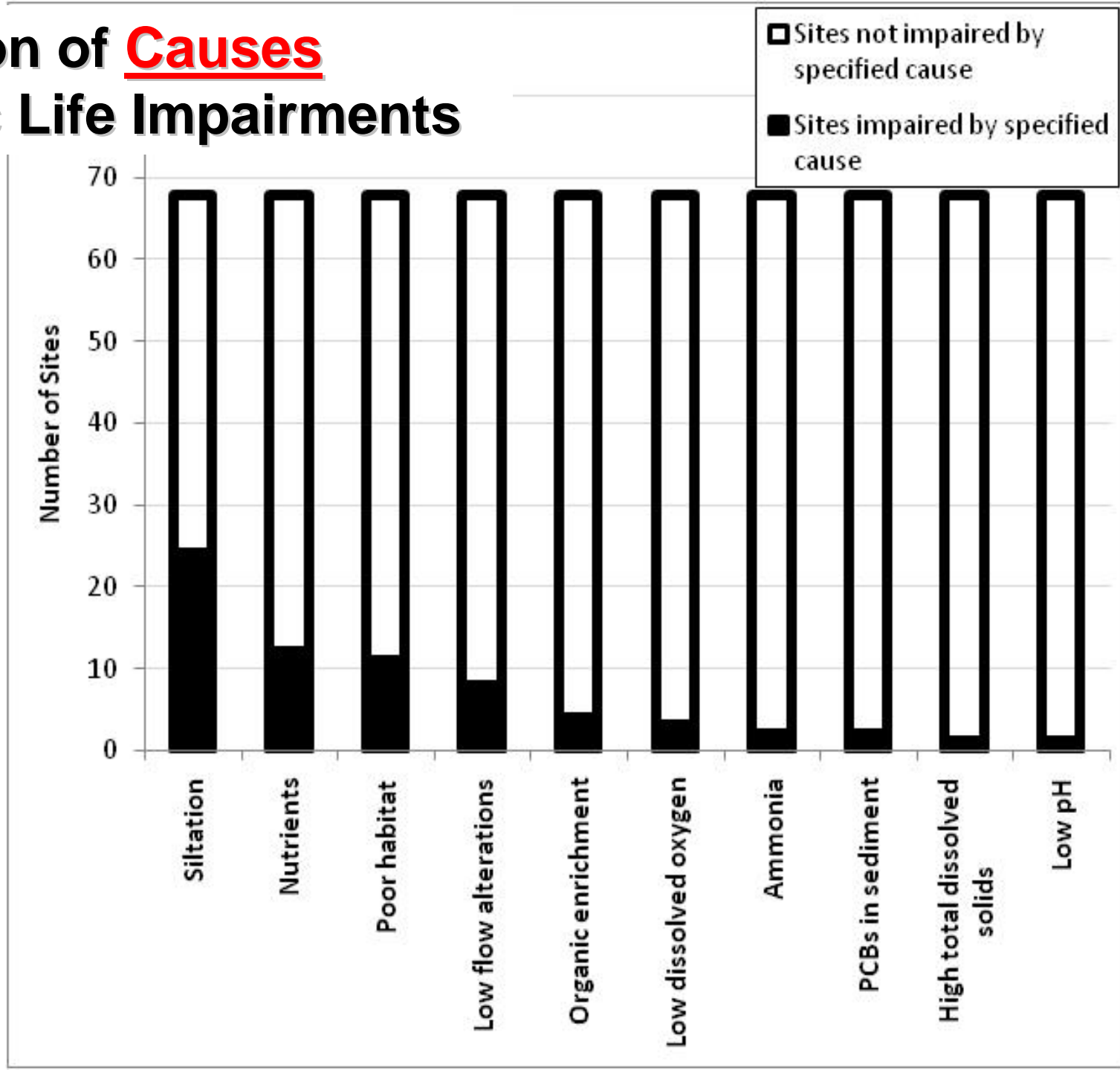
Sources

- **Cropland runoff**
 - **34% OF ALL SITES**
- **Channelization**
 - **29% OF ALL SITES**
- **Centralized Waste Water**
 - **6% OF ALL SITES**

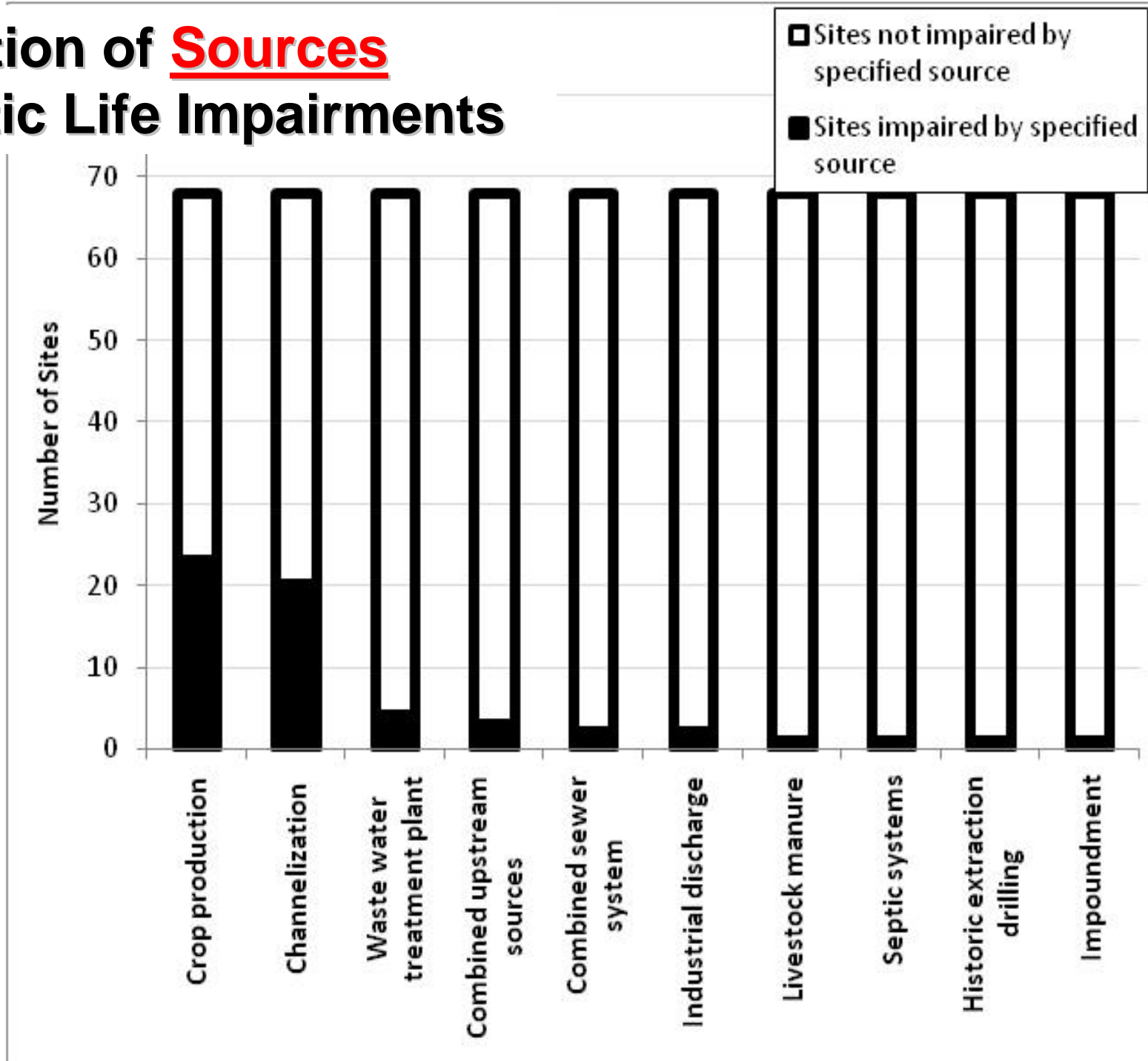
Distribution of Bacteria Sources



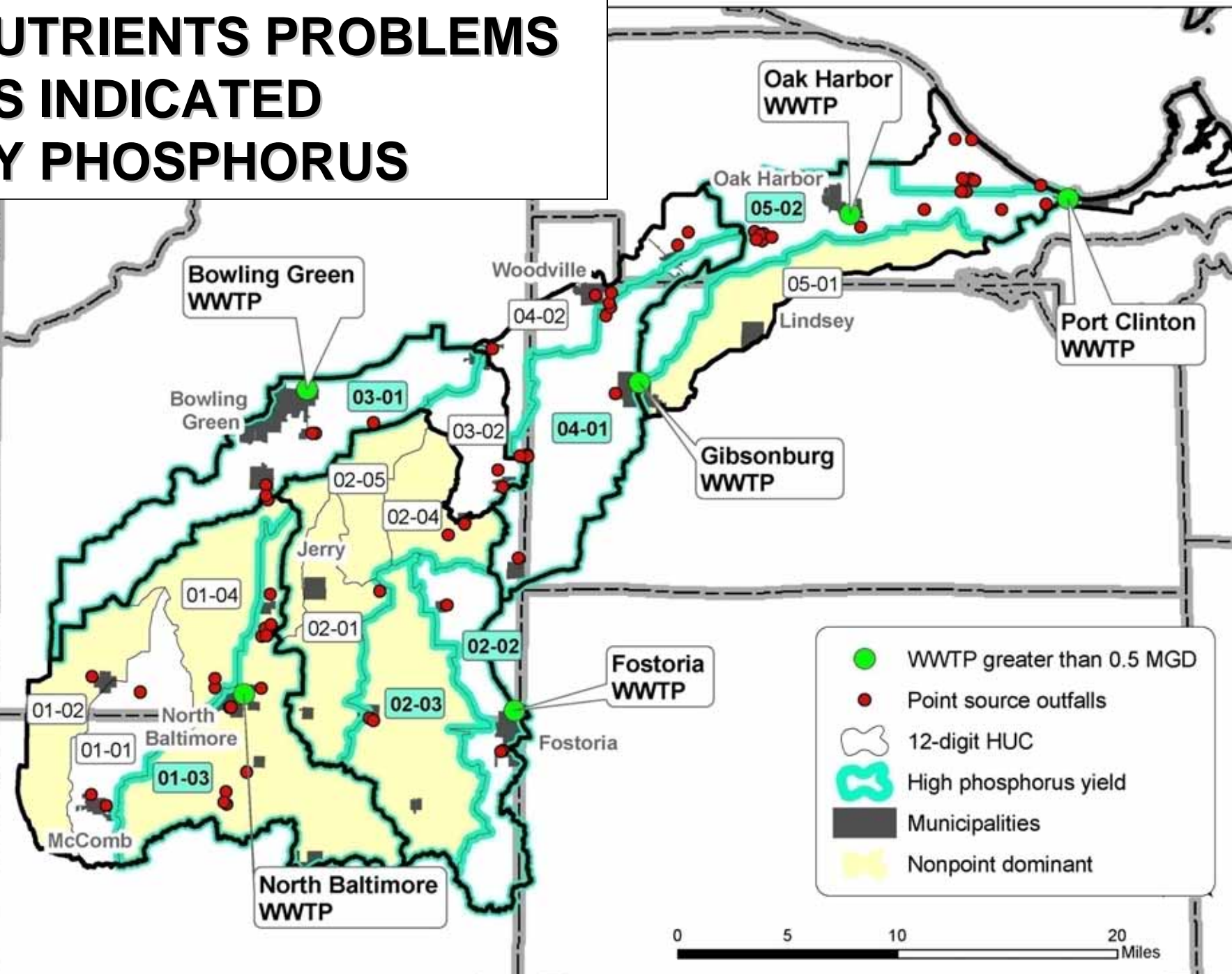
Distribution of Causes of Aquatic Life Impairments



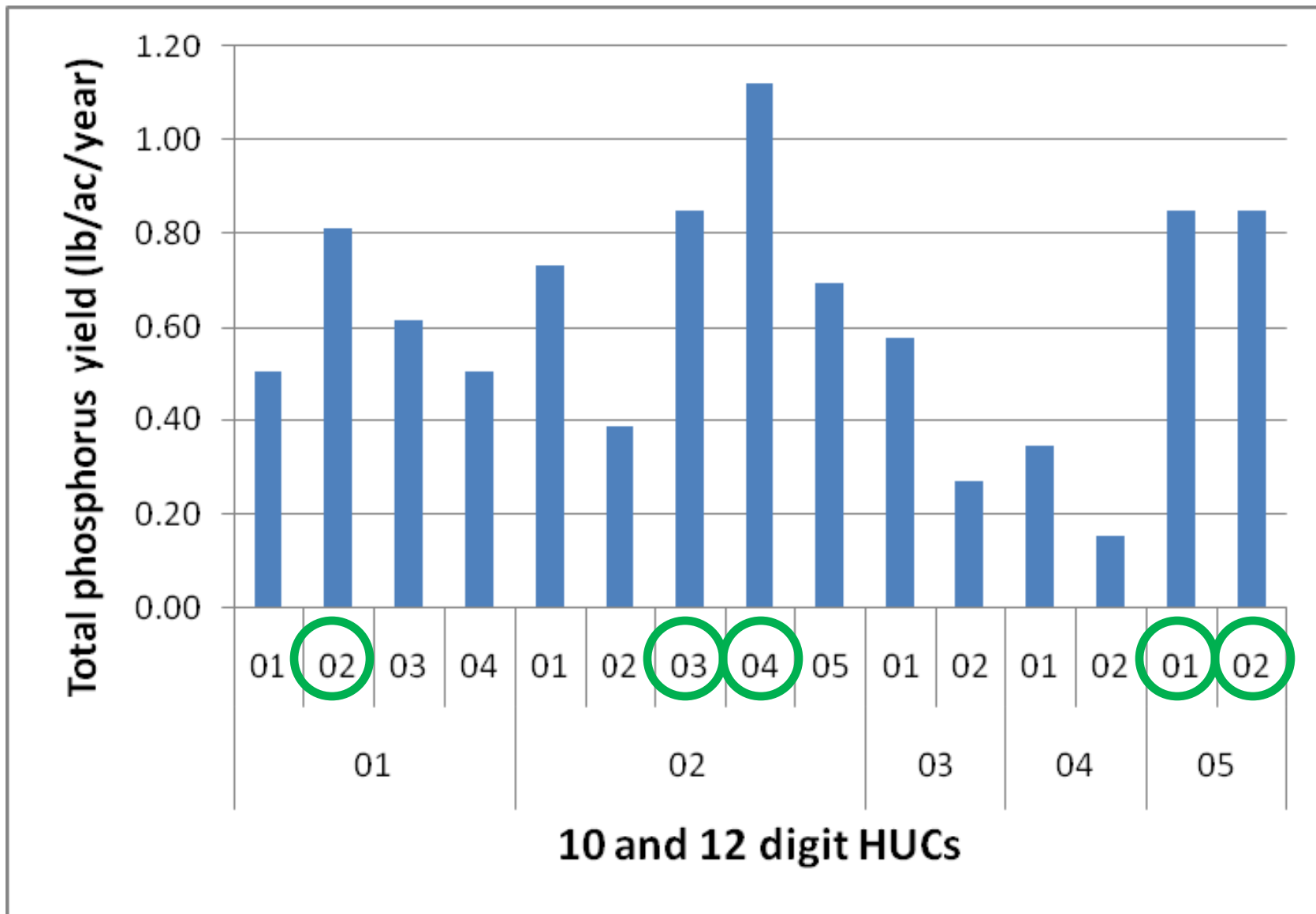
Distribution of Sources of Aquatic Life Impairments



NUTRIENTS PROBLEMS AS INDICATED BY PHOSPHORUS

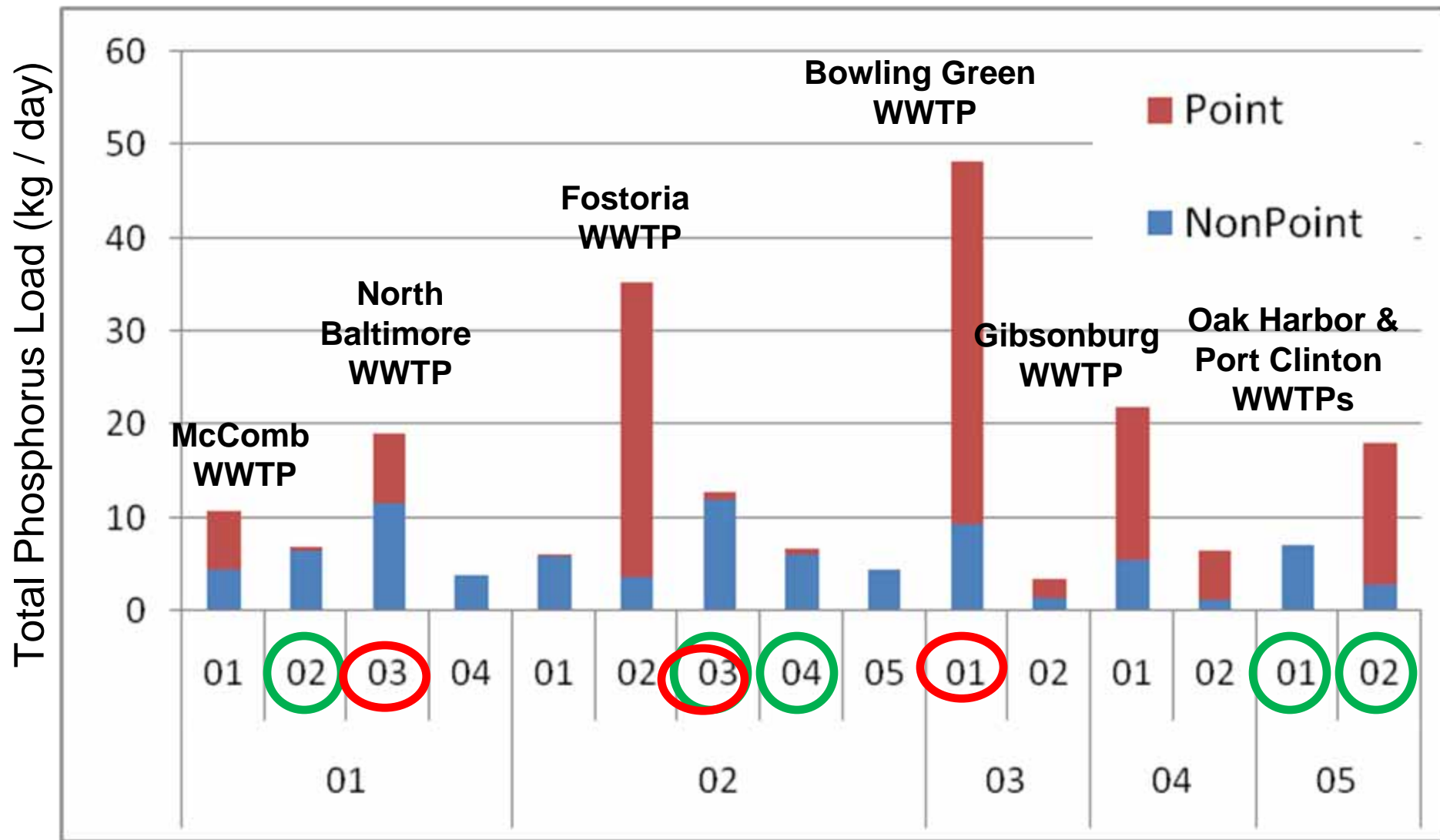


Total Phosphorus Nonpoint Source Yield in the Portage Watershed



Phosphorus load contributions between point and non point sources

- High NPS yield
- High overall NPS load



Ohio EPA Water Quality Criteria

- Most survey work is done to assess Aquatic Life and Recreation Uses
- Approach to sampling is to have a high density of survey sites
 - About 5 sites per 20 square mile of drainage area
- Other uses to assess include water supply (intake for water treatment plants) and fish consumption (contamination of fish tissue- mercury or PCBs)
- Final assessment of various stream locations is **based on the collected data in comparison to the existing water quality standards**

Water Quality Standards

Recreation Uses

- Protect people from getting water-borne illness
- Based on likelihood of the presence of disease causing microorganisms
- Fecal matter is dominant pathway for contamination
- E coli bacteria are good surrogate measures of the level of fecal contamination
- Concentrations of E coli represent the water quality standards
- Streams that are large enough (depth and area) to accommodate significant exposure should be afforded protections; however, location of significant populations or access to the stream is also considered

Aquatic Life

- Protect quality of the stream system to the point that a normal fish and macroinvertebrate community can persist
- Based on a sampling of these animals to determine if they are present in the system
- Measuring aquatic life is a way to integrate multiple pollutants over time. If problems exist, there will be a negative response in the biological community
- Biological metrics have been developed to measure such negative responses (based on a large data set)



Water Quality Standards

Recreation Uses

- Tiered recreation uses based on likelihood of recreation and the likely types of recreation.
- Standards are stricter when recreation is more likely.
- Designations and associated criteria are:
 - Primary Contact A = 126 CFU per 100 ml of sample
 - Primary Contact B = 161 CFU per 100 ml of sample
 - Secondary Contact = 1,030 CFU per 100 ml of sample
- Concentrations based on geometric mean
- Samples taken during recreation season (late spring to early fall)

Aquatic Life

- Tiered aquatic life based on the quality of the habitat and the presence or absence of persistent issues that will confound the biology
 - Ongoing ditch maintenance
 - Dams or other structures that preclude fish movement
- Two metrics using the numbers, weight and types of fish that are found during the sampling
 - Index of Biotic Integrity (IBI)
 - Modified Index of Well-Being (MiWB)
- One metric based on the number and type of macroinvertebrates collected during the sampling
 - Invertebrate Community Index (ICI)



Attainment Status

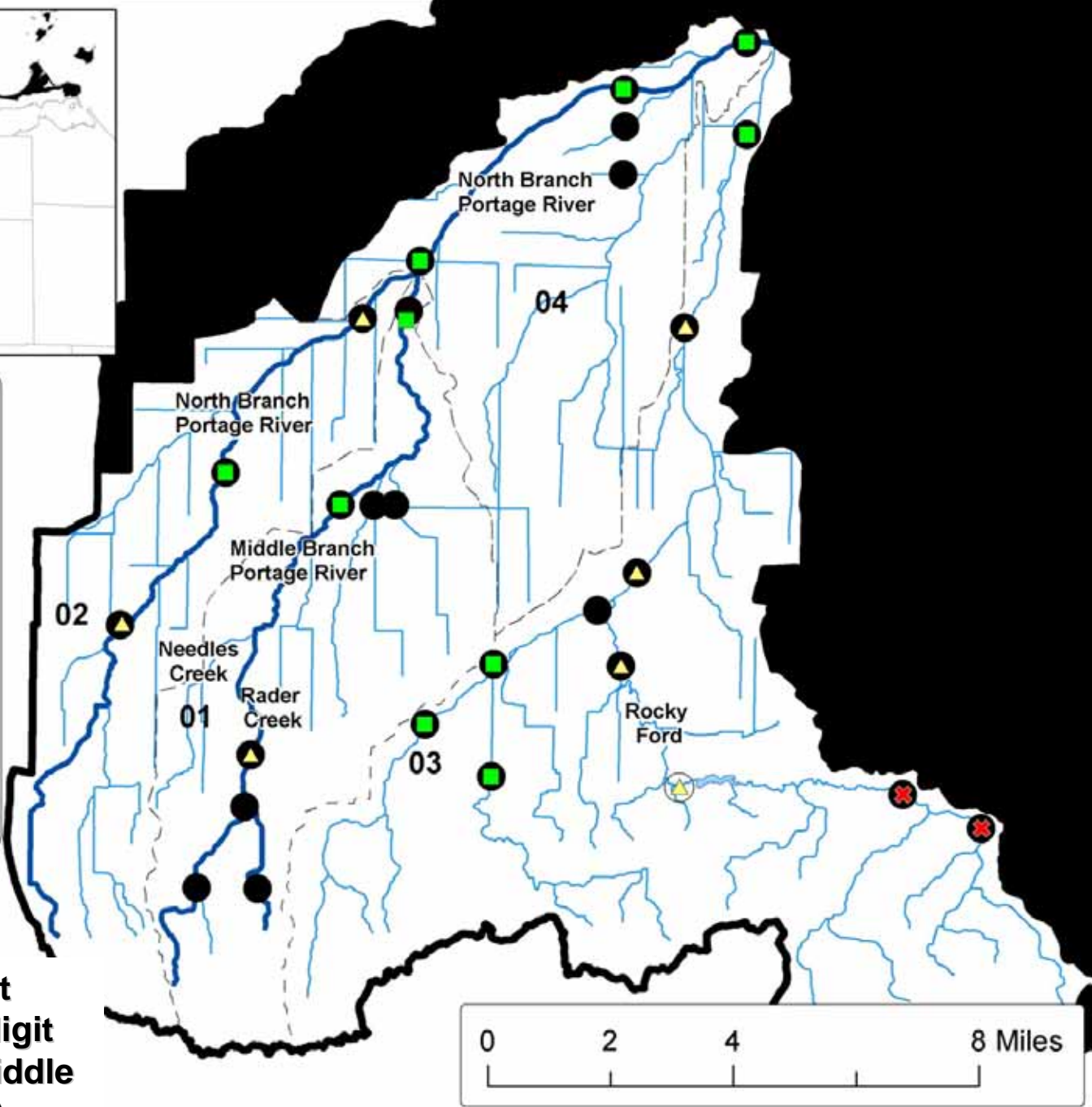
Aquatic Life

- Full
- ▲ Partial
- ✖ Non

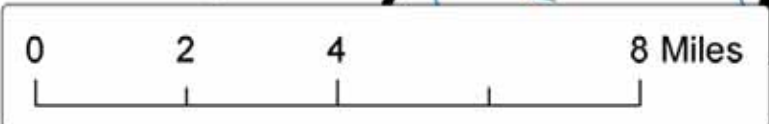
Recreation

- Attain
- Non

--- 12-digit HUC



Aquatic life attainment status for the 01 ten-digit HUC (Rocky Ford – Middle Branch Portage River)



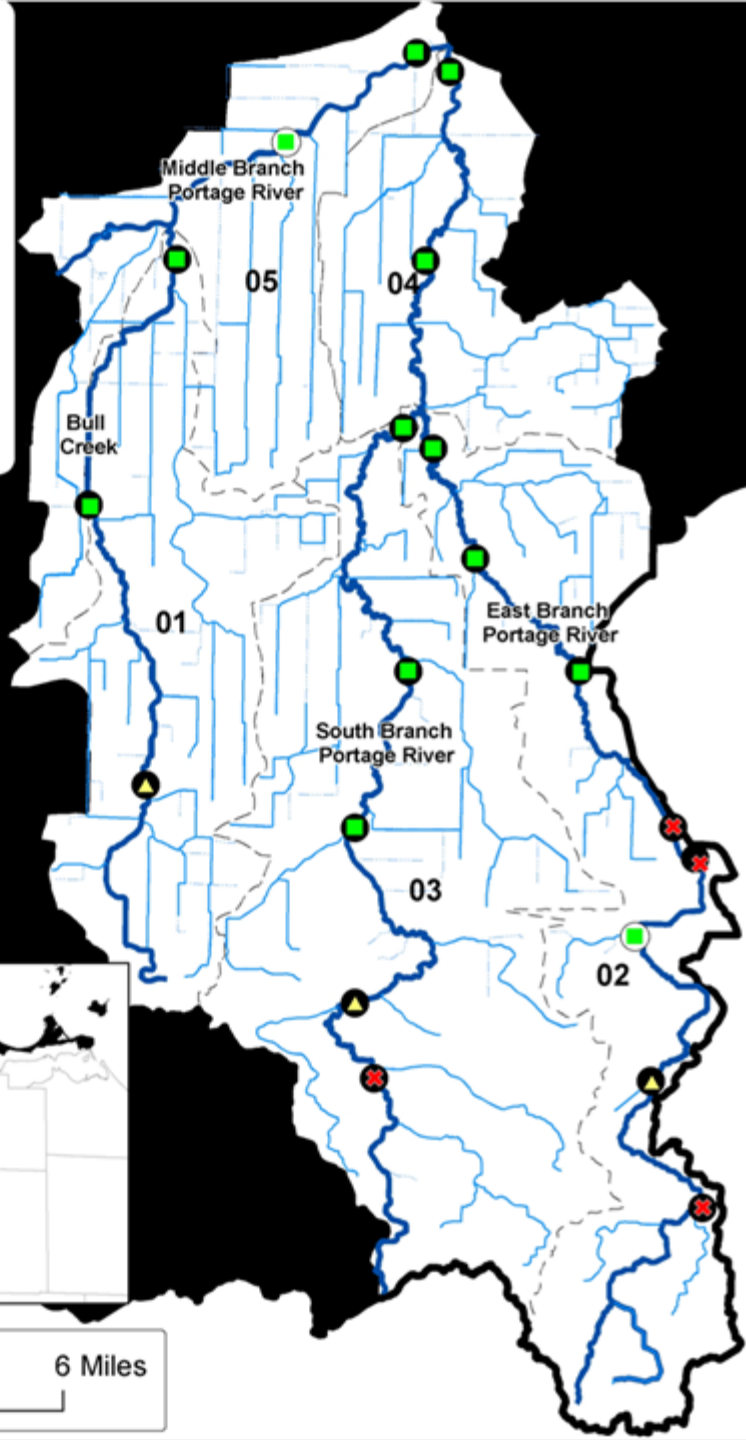
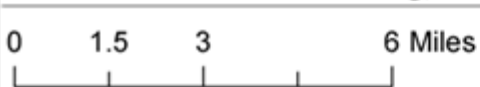
Attainment Status

Aquatic Life

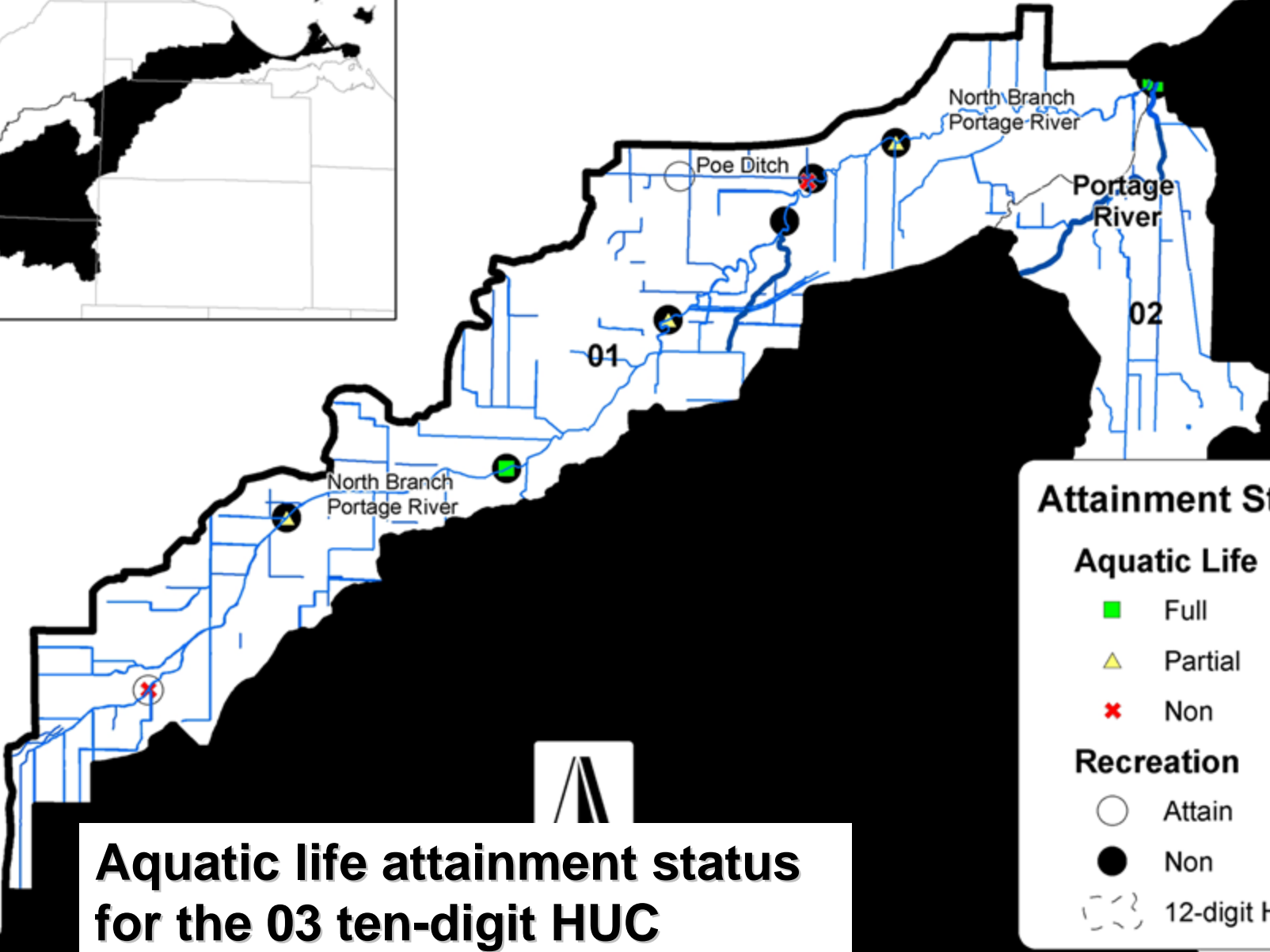
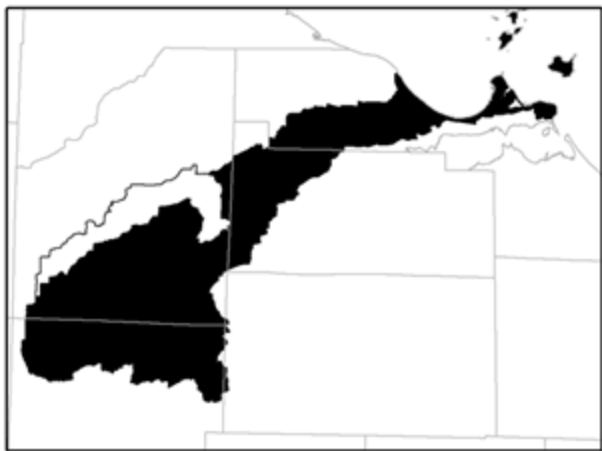
- Full
- ▲ Partial
- ✖ Non

Recreation

- Attain
- Non
- 12-digit HUC



Aquatic life attainment status for the 02 ten-digit HUC (South Branch Portage River – Middle Branch Portage River)



Attainment Status

Aquatic Life

- Full
- ▲ Partial
- ✕ Non

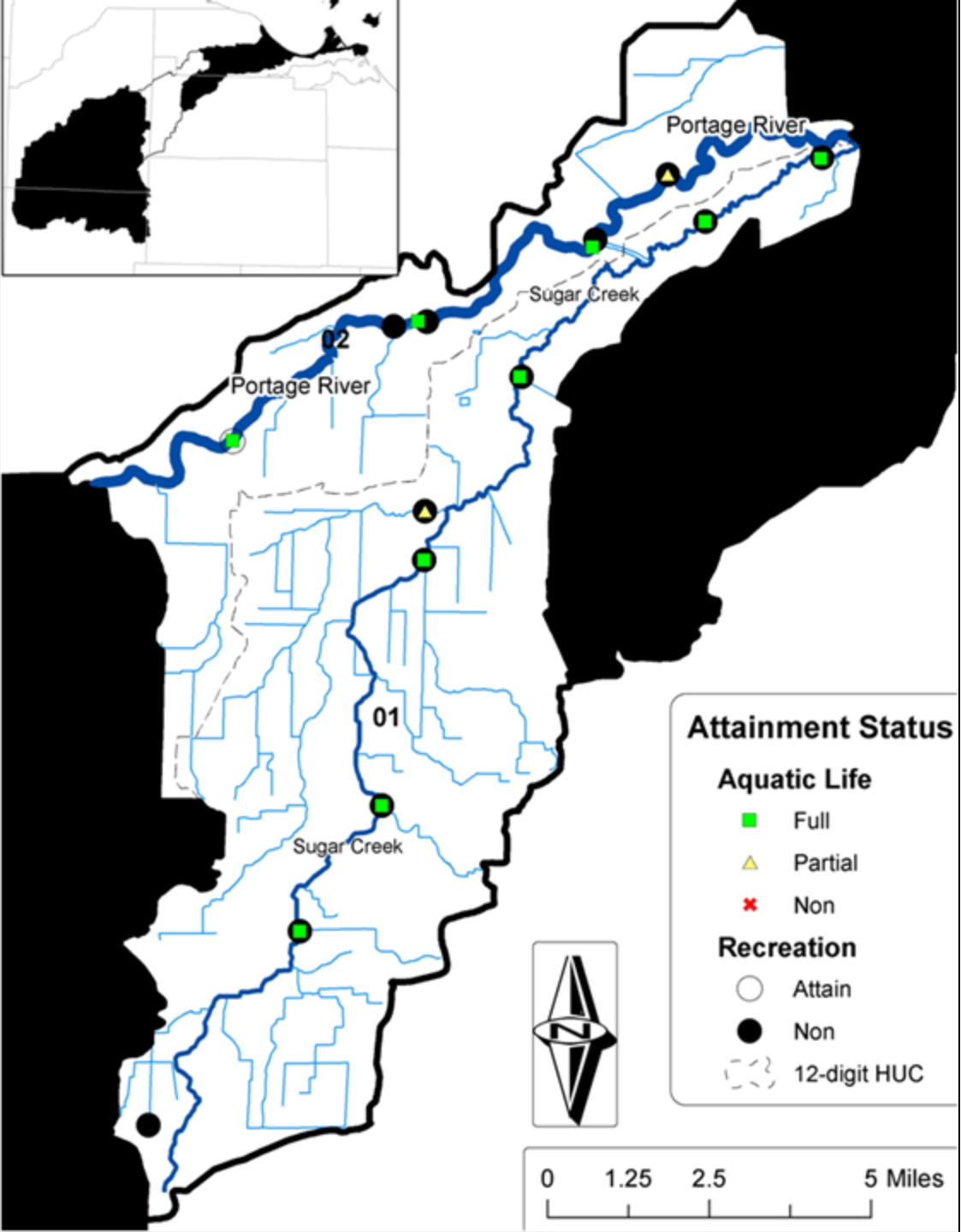
Recreation

- Attain
- Non
- - - 12-digit HUC

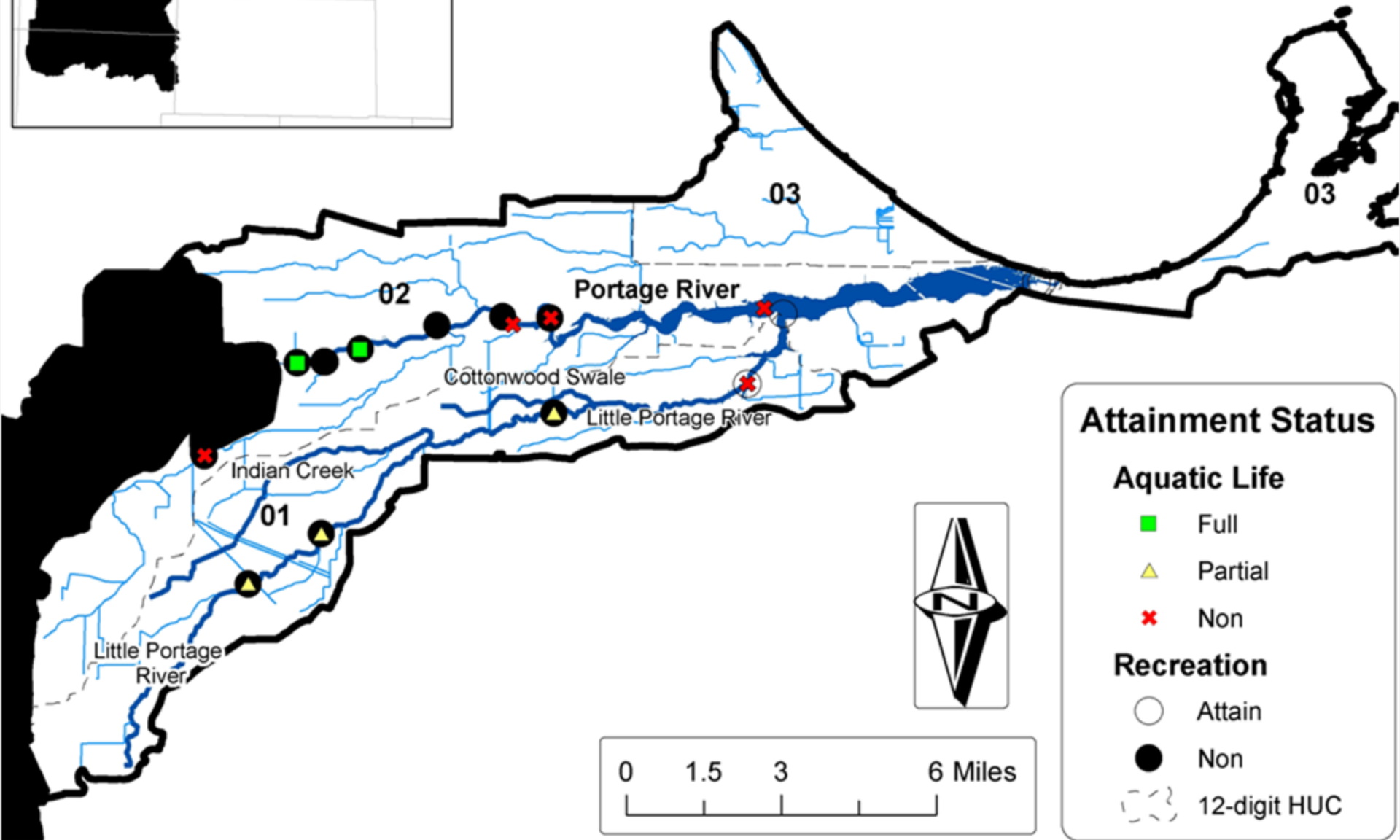
Aquatic life attainment status for the 03 ten-digit HUC (Upper Portage River)










Aquatic life attainment status for the 04 ten-digit HUC (Middle Portage River)



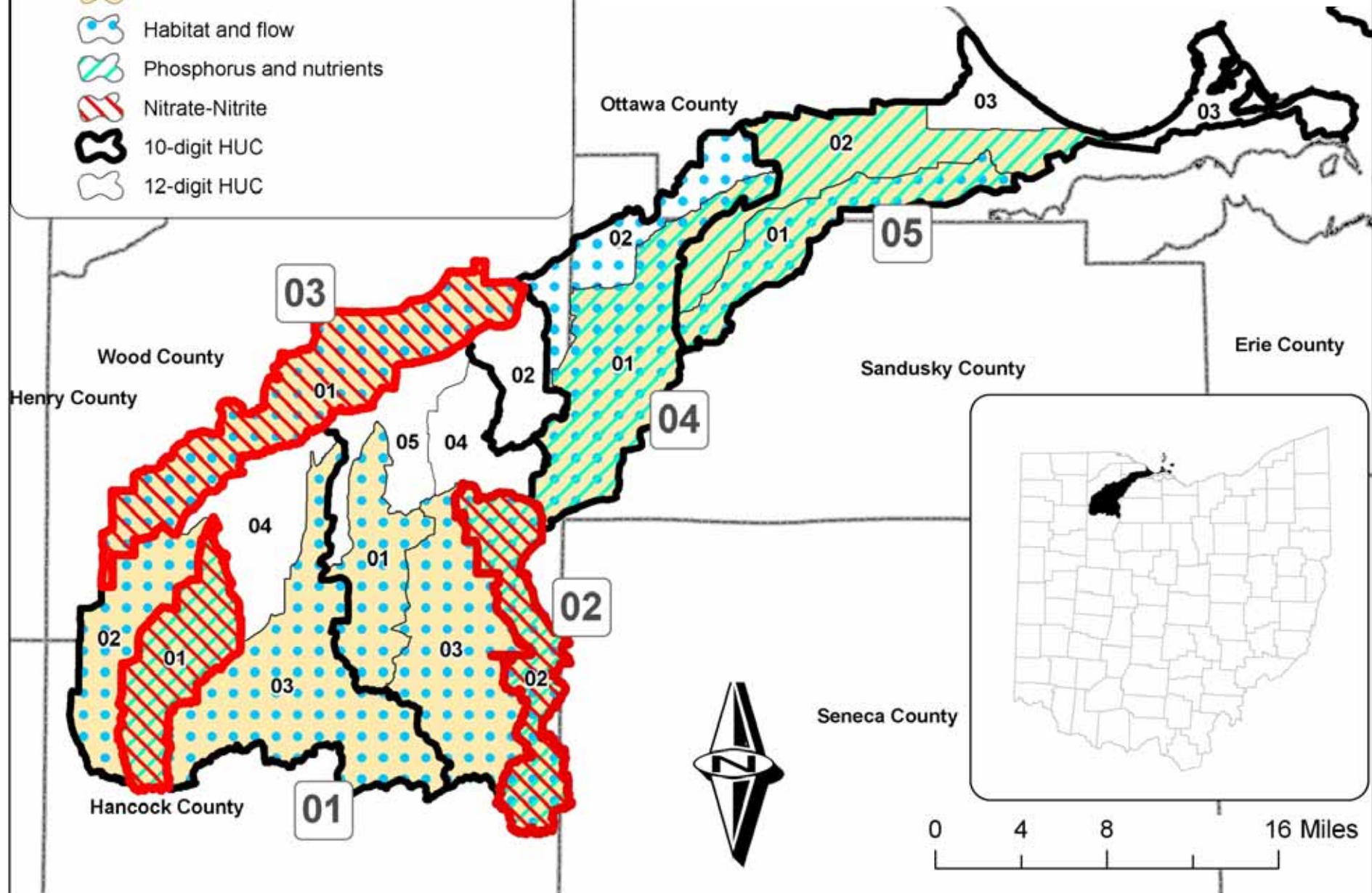
Aquatic life attainment status for the 05 ten-digit HUC (Lower Portage-Frontal Lake)









List of Primary Causes of Impairments

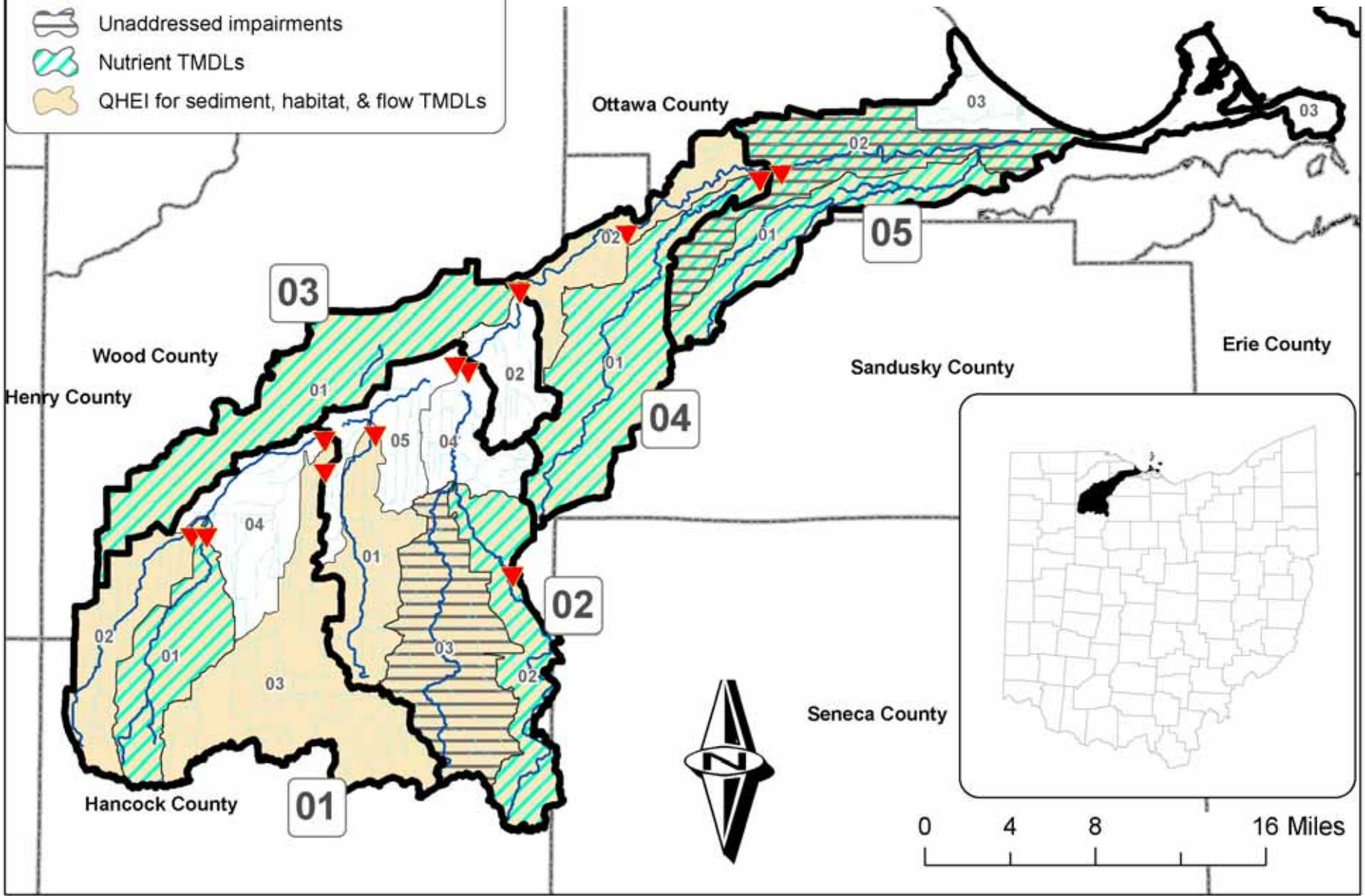
-  Dissolved oxygen & organic enrichment
-  Sediment
-  Habitat and flow
-  Phosphorus and nutrients
-  Nitrate-Nitrite
-  10-digit HUC
-  12-digit HUC

Distribution of causes by assessment unit



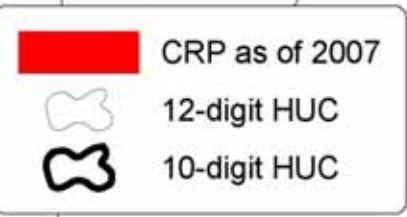
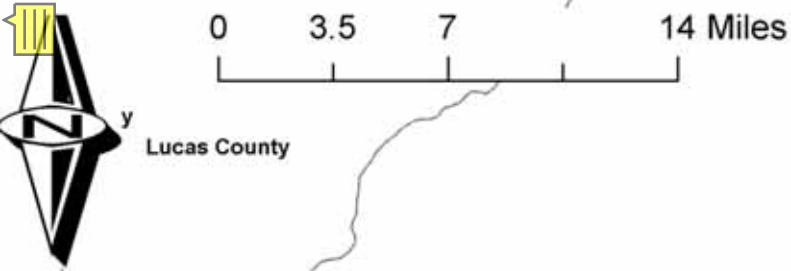
Pollutant loading calculations (TMDL development)

-  10-digit HUC
-  12-digit HUC
-  Load duration curves for bacteria TMDLs
-  Unaddressed impairments
-  Nutrient TMDLs
-  QHEI for sediment, habitat, & flow TMDLs



Summary of what Ohio EPA is aware of in terms of past water quality programs

- Home septic systems –
 - County plans and \$\$ for abating failed systems
- Lake Erie CREP
 - For buffer/filter strips and wetlands
- Watershed Action planning



Overall CRP is about 2.22% of all cropland

10-digit HUC	01	02	03	04	05	Grand Total
Overall CRP acres	1,572	2,562	839	792	1,055	6,820
CP21 (grass filter)	974	1,297	435	293	140	3,139
CP2 (native grasses)	43	452	123	343	214	1,174
CP25 (declining habitat)	196	269	157	8	-	630
CP4D (permanent wildlife habitat)	65	111	22	43	367	608
CP23 (wetlands)	110	177	34	13	34	368
CP22 (riparian)	18	-	-	1	-	19

Questions to be asked

- What has been done so far in the watershed to address water quality?
 - What were the successes and failures that we can learn from?
- What is **still needed** to address most recent problems identified?
 - What resources are needed?
 - What obstacles should be expected?

NPS recommendations so far . . .

Cropland areas

- Cover cropping
- Residue management
- Nutrient management
- Filter strips and hydraulic buffers
- Wetlands
- Controlled drainage

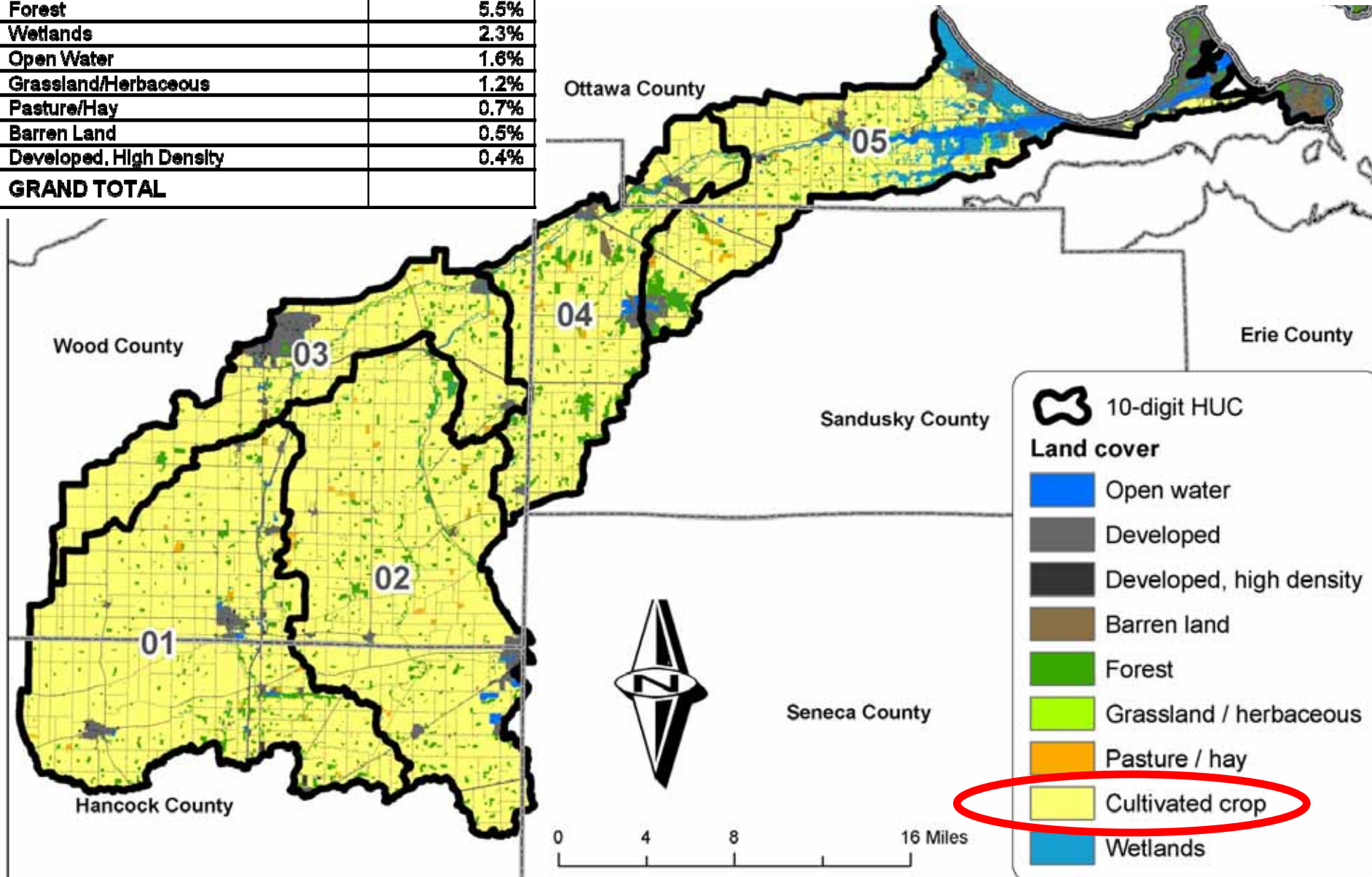
Channelization and Septic Systems

- Two-stage ditches
- Floodplain and/or stream restoration
- Increased inspection of septic systems and enforcement as needed
- Education and awareness on septic systems management

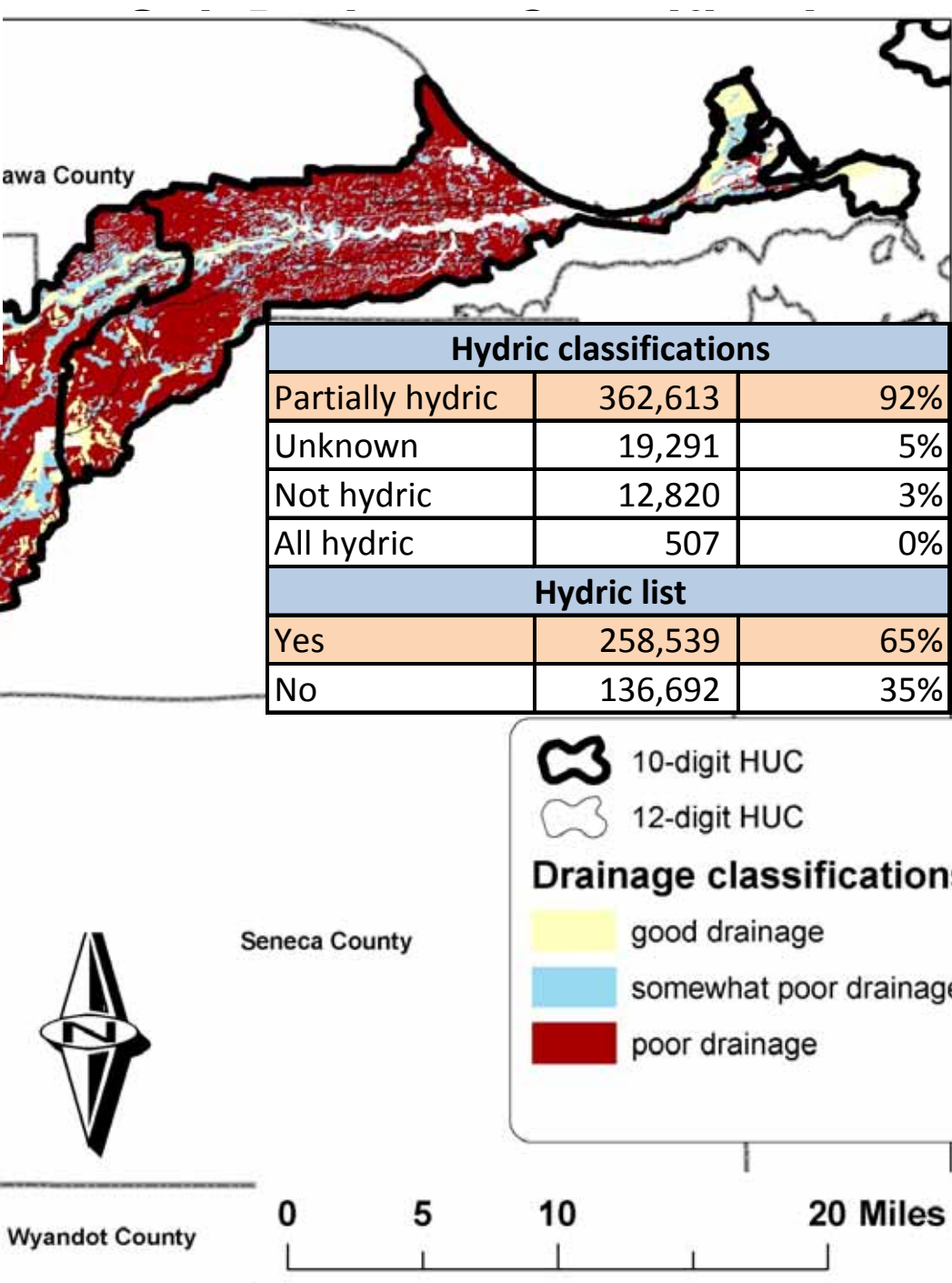
Watershed Characteristics

Land Cover Classifications

Land cover class	Percent coverage
Cultivated Crop	76.5%
Developed	11.4%
Forest	5.5%
Wetlands	2.3%
Open Water	1.6%
Grassland/Herbaceous	1.2%
Pasture/Hay	0.7%
Barren Land	0.5%
Developed, High Density	0.4%
GRAND TOTAL	



Drainage Class	Acres	Percent total
Very poorly drained	258,349	64%
Somewhat poorly drained	74,174	18%
Moderately well drained	34,822	9%
Well drained	20,905	5.2%
Not designated	11,913	3.0%
Poorly drained	756	0.2%
Somewhat excessively drained	51	0.0%
Grand Total	400,970	



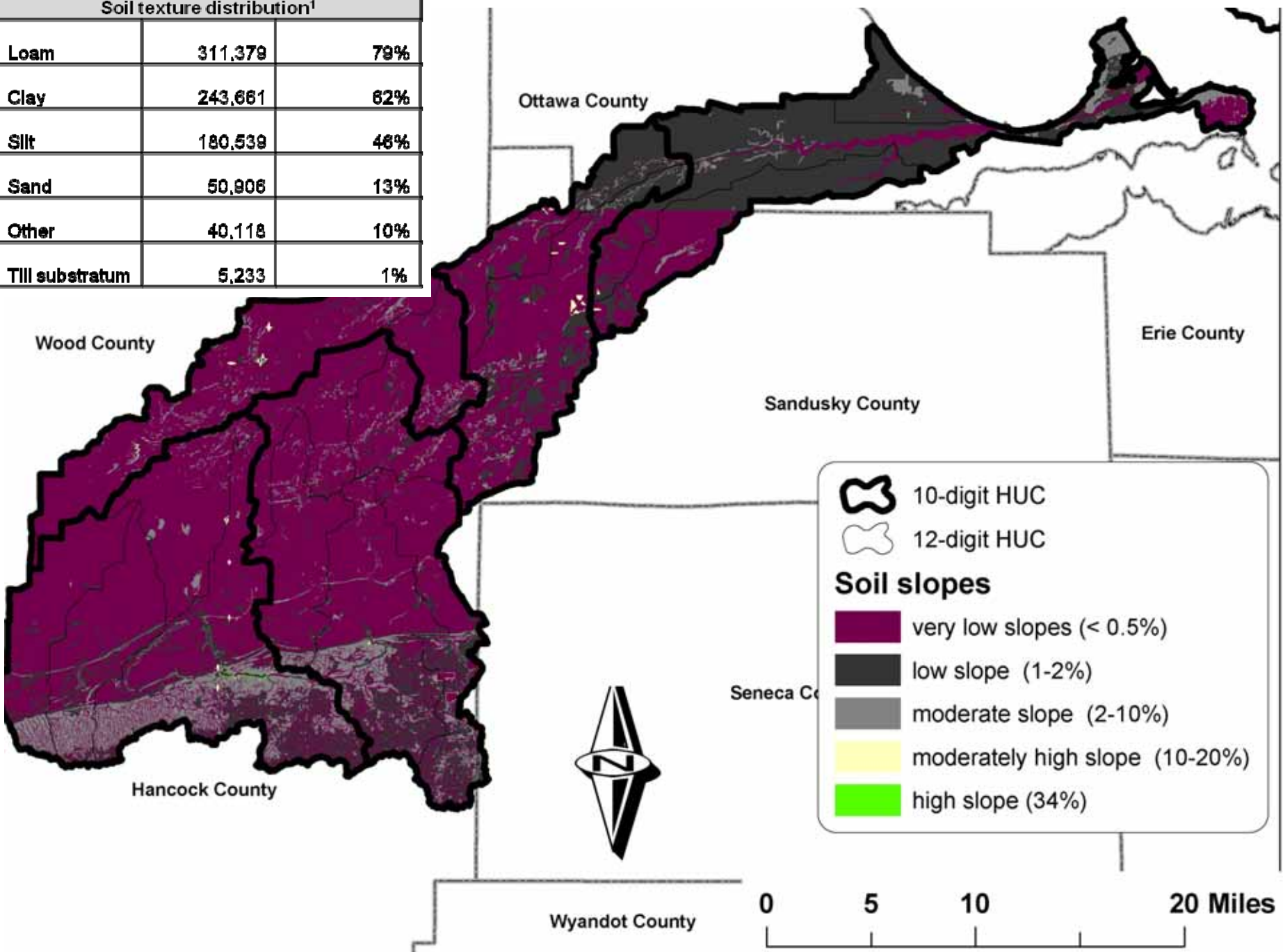
Hydric classifications		
Partially hydric	362,613	92%
Unknown	19,291	5%
Not hydric	12,820	3%
All hydric	507	0%
Hydric list		
Yes	258,539	65%
No	136,692	35%

- 10-digit HUC
 - 12-digit HUC
- Drainage classifications**
- good drainage
 - somewhat poor drainage
 - poor drainage



Soil texture distribution¹

Loam	311,379	79%
Clay	243,661	62%
Silt	180,539	46%
Sand	50,906	13%
Other	40,118	10%
Till substratum	5,233	1%



10-digit HUC
12-digit HUC

Soil slopes

- very low slopes (< 0.5%)
- low slope (1-2%)
- moderate slope (2-10%)
- moderately high slope (10-20%)
- high slope (34%)

Wyandot County

