Cobus Creek Watershed Diagnostic Study

Steering Committee Recap

June 28, 2016 – 2:30pm

Elkhart Conservation Club – Elkhart, IN

Attendees	
Jeremy Reiman	Michiana Area Council of Governments / St. Joseph River Basin Commission
Steve Schweisberger	Elkhart County Surveyor's Office
Deb Jimison	Elkhart County Soil and Water Conservation District
Marcy Colclough	Southwestern Michigan Planning Commission
Paula Sniadecki	Ontwa Township
Joan Sniadecki	Ontwa Township
Adam Bowden	St. Joseph County Dept. of Public Works
Larry Magliozzi	St. Joseph County Area Plan Commission
Ronda DeCaire	Elkhart County Parks Department
Grant Poole	Pokagon Band of Potawatomi – Dept of Natural Resources
Kim Haas	Friends of Cobus Creek
Warren Allender	Elkhart Conservation Club
Charlie	Elkhart Conservation Club
Jessica Faust	Indiana Dept of Environmental Management – Watershed Planning Branch
Bruce Campbell	Cass County Drain Commissioner

SJRBC
St Joseph River Basin Commission

Meeting Summary

Since the first steering committee meeting in January, the St. Joseph River Basin Commission has worked with the Cobus Creek study's consultant, Arion Consultants, and other project partners on summarizing historical watershed data and collecting landuse, habitat, water quality, and aquatic organism data. The purpose of the meeting was to provide the steering committee with an update on the project's tasks and share watershed information. Below is a summary of the historical and in-the-field data presented to the project steering committee.

Historic Data

Landuse

The landuse in Cobus Creek Watershed is primarily cultivated cropland (40%) (See Figure 1). The next largest landuse is development (32%), which is primarily developed open space and low intensity development focused in the southern half of the watershed. Approximately 12% of the watershed is composed of forest land which is located primarily in the headwaters of the watershed in Michigan. As part of in-the-field data collection, we will be analyzing low and medium impact developments across the watershed to gather a better understanding of the actual landuse in place on these parcels.

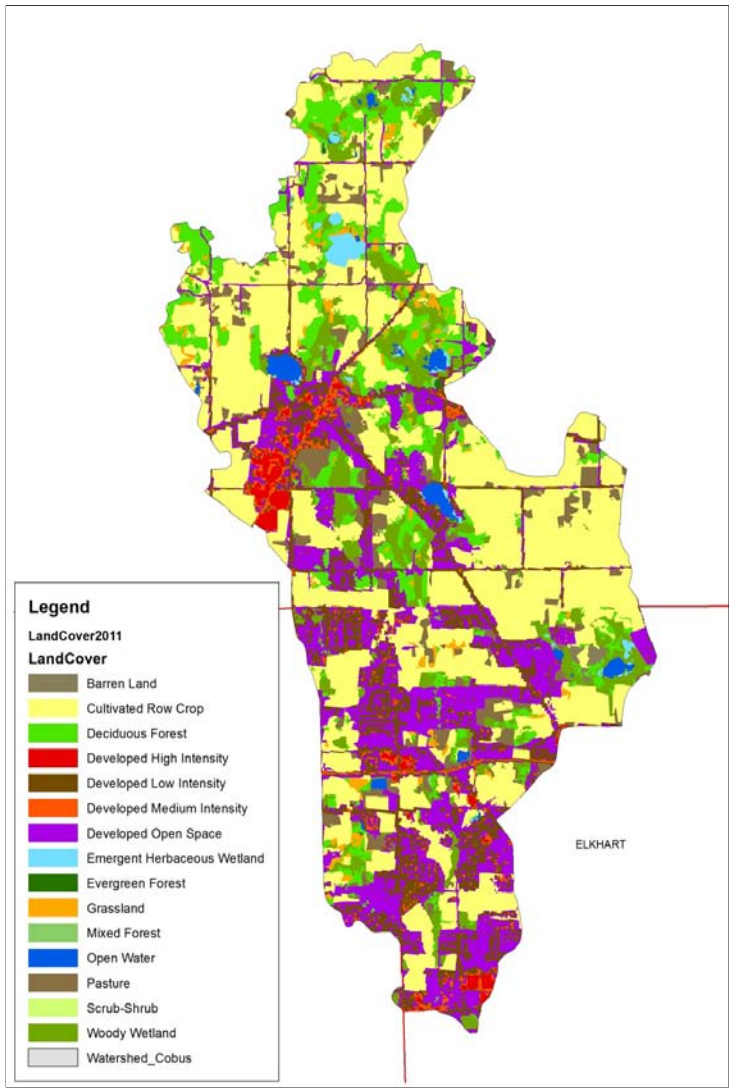


Figure 1: Cobus Creek Watershed's landuse

Soil Erodibility

Soil Erodibility is how likely a soil is to be carried away by water, wind, or other disturbances; therefore, it is important that we identify and manage erodible soils in close proximity to our water ways and other natural resources. The U.S. Department of Agriculture's Natural Resource Conservation Service identifies highly erodible soils (HES) and potentially highly erodible soils (PHES) based on various soil properties. A significant majority of the soils in Cobus Creek Watershed are not classified as HES or PHES, however, both soil classifications are present in the watershed. There are HES located in the most northern reaches of the watershed. PHES are located along the long portion of Cobus Creek's main channel, as well as around a few lakes in Michigan.

Septic Limitations

Based on soil drainage classifications, the height of the water table, and other factors, certain soil types are identified as not suitable for septic systems. It is a serious concern for environmental and public health when septic systems are located in dense clusters on small lots on not suitable soils. Approximately 62% of the watershed is classified as severely not suitable for septic systems. As part of the study we will be locating portions of the watershed that may benefit from making the transition over to sewer services.

Wetlands

Cobus Creek has retained approximately 62% of its pre-settlement wetlands (See Figure 2), one of the highest wetland retention rates amongst subwatersheds of the St. Joseph River Basin. The majority of these wetlands are located in the Michigan portion of the watershed, along the headwaters of Cobus Creek and Gast Ditch. The majority of lost wetlands were located along Gast Ditch and Cobus Creek in the Indiana Portion of the Watershed. According to the a Wetlands Function dataset compiled by the Michigan Department of Agriculture and Rural Development, the majority of the wetlands lost in the watershed provided excellent fish, amphibian, and bird habitat.

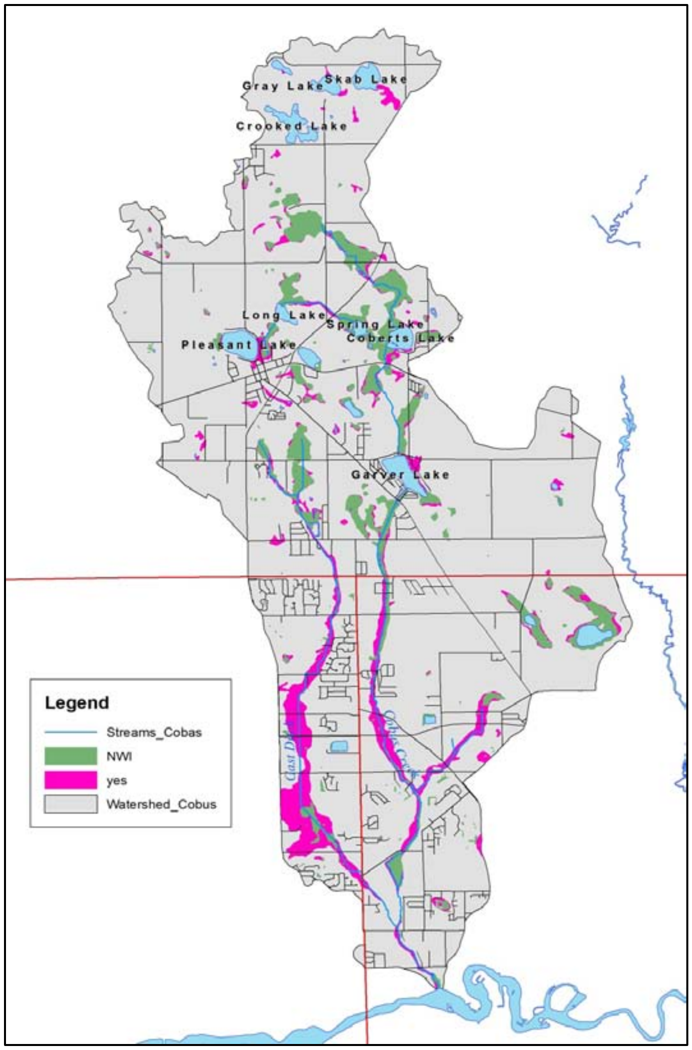


Figure 2: Cobus Creek Watershed's current and historic wetlands. The green polygons represent wetlands currently in tact. The pink polygons represent where wetlands were once present.

Endangered, Threatened, & Rare Species

15 endangered, threatened, or rate (ETR) species have been sighted on the Indiana side of the watershed according to an Indiana Department of Natural Resources dataset.

- o 6 plants
- o 4 reptile
- o 3 bird
- o 1 mammal
- o 1 fish

While the precise locations or details of these species are not public information, we do have the general locations of sightings mapped. Additionally, 2 high quality habitats within Boot Lake

Nature Preserve were identified. A steering committee member will be providing the project team with information on how to access Michigan's ETR species database. Any ETR species identified in the Michigan portion of the watershed will be included in the final study as well.

Monitoring Data

Cobus Creek's main channel and Garver Lake have been sampled for chemical parameters, fish, and macroinvertebrates in the past. The following is a list of the various groups that have conducted sampling in the watershed.

- Indiana Department of Environmental Management
- City of Elkhart – Aquatic Biology
- Elkhart County Health Department
- Michigan Department of Natural Resources
- Hoosier River Watch

While sampling frequency, locations, quality control, and parameters have been fairly inconsistent, we can draw the general consensus that historically water quality within the main channel of Cobus Creek appears to be fair. The following is a brief summary of the findings historic water sampling findings.

- Dissolved oxygen, temperature, and conductivity have been within healthy levels
- Total phosphorus and E*scherichiaia coli* levels tend to be elevated during the growing season
- pH samples have exceed the IN state standard of 9.0
- Cobus Creek's fish communities are not considered "exceptional" (Elkhart Aquatic Biology – Cobus Creek Assessment, 2014)

New Data Collected

Windshield Survey

In mid-spring, St. Joseph River Basin Commission staff and the project consultant drove the entire span of watershed to document land use activities that could not be identified from landuse data or aerial photographs. Based on the initial windshield survey data collected, the follow information was documented:

- Approximately 8,270 acres of agriculture land would benefit from best management practice implementation (conservation tillage, cover crops)*
- 0.9 miles of stream bank are in need of bank stabilization (1.8 mi both sides)*
- 3.2 miles of stream are in need of riparian buffers (5.2 mi both sides in some locations)*

All numbers above are initial values that are subject to change as we continue in-the-field investigations

Fish Sampling

Figure 3: Brown Trout found in Cobus Creek at County Road 12 in Elkhart County

Surveys of fish communities have been taken at 11 sites in the watershed (See Figure 4 or Attachment A for Sample Locations). While not all fish data analysis is complete, the following are initial observations based on the data collected:

- Fish diversity and Cobus Creek stream health appears higher quality in the southern portion of the watershed
- Sensitive fish species have been found in the lower ends of Cobus Creek
- Identified signs of brown trout natural reproduction
- Gast Ditch and Cobus east lateral have significantly impaired fish communities
- Largest limitation for fish communities is habitat degradation
  - Channelization of streams1
  - Dams and perched culverts fragmenting fish communities
- Upper reaches of the watershed and lake outlets tend to host warmwater species
- Main stem of Cobus Creek hosts coolwater species

A more in-depth analysis of fish surveys will be completed as a component of the final study.

Chemical Sampling

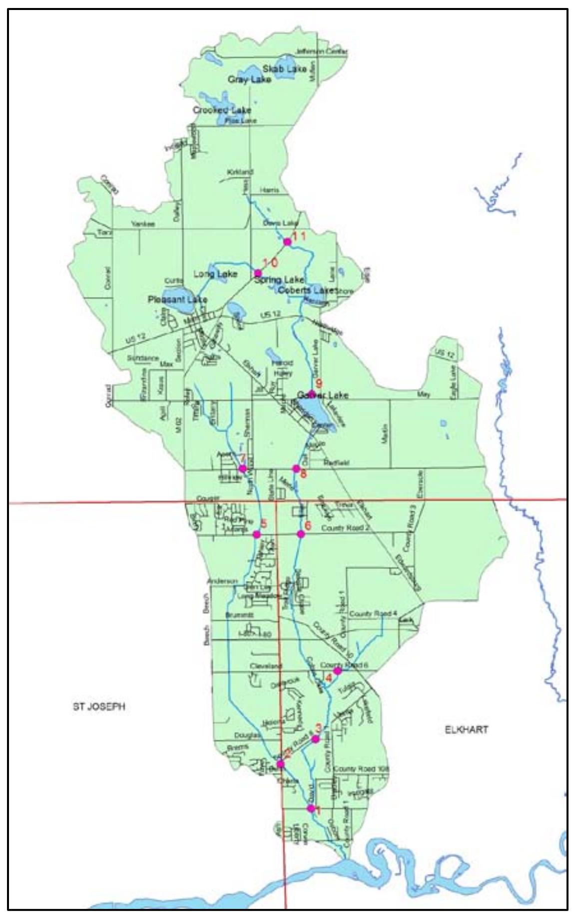


Figure 4: Study sample sites. Chemical and aquatic organisms will be sampled at each site.

Two chemical water quality samples will be taken at eleven (11) sites in the watershed as part of this study (See Figure 4 or Attachment A for Sample Locations). One during regular base-flow conditions and one during wet weather flow. To date, one baseflow sample has been taken at all sites. Below are initial water quality observations and calculations based on baseflow sample results (See Attachment B for baseflow concentration data and Attached C for information on water quality target values):

- Orthophophate levels exceeded the target value of 0.03 mg/l at all sites
- Total Phosphorus levels exceeded target value of 0.08 mg/l at the majority of sites

- NO$_3$ exceeded the target value of 2.00 mg/l at Site 11
- Pollutant loading for each site was calculated (Attachment D)
  - Site 1 had the highest loading of all contaminants
  - Site 3 had the second highest loading for nearly all contaminants
  - Site 11 had the second highest loading of NO$_3$
  - Site 8 had the third highest loading of orthophosphates
- Pollutant yields were calculated at each site by dividing loading values by the sites drainage area (Attachment E). Yield allows us to compare grams of pollutant/day/ acre of land.
  - Sites 5 & 7 on Gast Ditch had the majority of the highest pollutant yields in the watershed
  - Site 11 had the highest yields of NO$_3$ and total suspended solids
  - Site 1 had the third highest yields of NO$_3$, NH$_3$, orthophosphates, & total phosphorus

The information above gives us an initial idea of Cobus Creek's current water quality; however, we cannot effectively draw conclusions on Cobus Creek watersheds water quality based on this data alone. We will have a much better understanding of Cobus Creek's health once we can analyze and model this data with wet weather flow data and aquatic organism survey data. See Attachment C for more information on water quality target values.

Subwatershed Data

Each sample site's drainage basin, or subwatershed to Cobus Creek, was computed using current computer modeling systems (See Figure 5 or Attachment F for subwatershed map). These subwatersheds allow us to break up Cobus Creek's watershed into several pieces, analyze the various resources within those subwatersheds, and geographically prioritize our management efforts. Below are some examples of resources unique to subwatersheds of Cobus Creeks:

- Site 9 subwatershed contains approximately 340 acres of wetlands with a 97% retention rate of presettlement wetlands. These wetlands likely play an important role in filtering out pollutants in surface water runoff that would otherwise enter main channel of Cobus Creek before draining into Garver Lake
- Approximately 40% of the soils in Site 10 subwatershed are classified has highly erodible or potentially highly erodible. This is of concern as site 10 is has a significant amount of agriculture in its drainage basin and is in the headwaters of Cobus Creek's Watershed, which

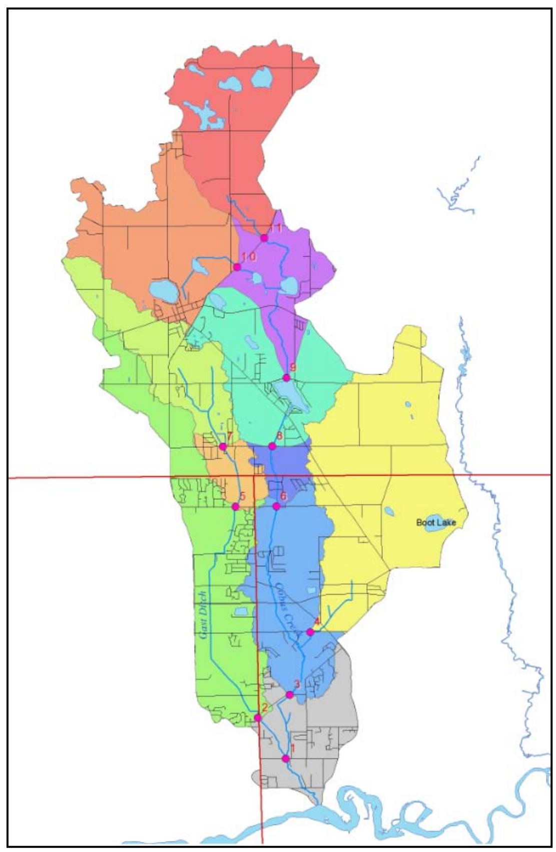


Figure 5: Study sample sites's drainages or "subwatersheds" to Cobus Creek Watershed

drains into the main channel of Cobus Creek. This subwatershed may benefit from soil conservation practices to improve water quality in the upper most reaches of Cobus Creek.

- Approximately 97% of the soils in Site 3 subwatershed are classified as severely limited for septic systems. It would be beneficial to run an analysis evaluating the possibility of hooking residents in this area up to City of Elkhart sewer, as it would greatly risk the potential of septic systems contamination water resources in this portion of the watershed.

As we continue to gather data on resources in Cobus Creek Watershed, we will be continuing to run analysis at the subwatershed level so that we can ensure that we are prioritizing our management efforts between projects improving Cobus Creek's natural environment, as well as protecting its most valuable resources.

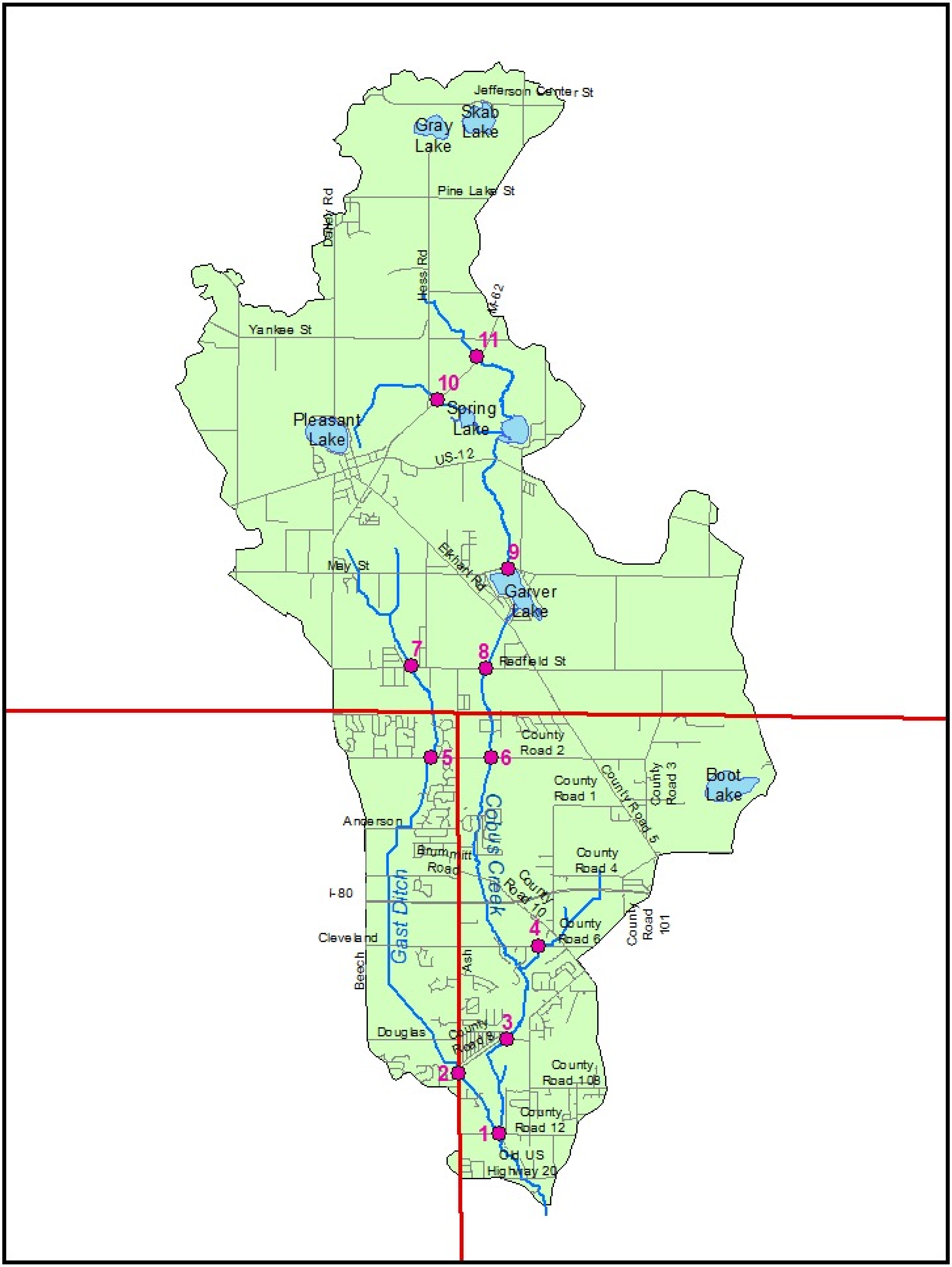
Next Steps

Data collection on the following resources will continue through the end of fall 2016:

- 1 wet weather chemical sampling
- Macroinvertebrate samples – providing us with a better idea of historic water quality trends in Cobus Creek Watershed
- Aquatic organisms stream crossing passage assessment – will evaluate how well aquatic organisms are able to move through Cobus Creek watershed and identify any potential barriers to organism movement within the watershed
- Additional site investigations and habitat assessments in Indiana and Michigan

Once all data is collected, it will be heavily analyzed and placed into computer simulations to model pollutants at the subwatershed level. Based on the results of pollutant modeling and input from the steering committee, we will begin prioritizing management recommendations for Cobus Creek and its resources. All collected data, analysis, and recommendations will be compiled into a report which will be available for public review. The final report is intended to be approved by Indiana Department of Natural Resources Lake and River Enhancement Program staff by the end of March 2017.

The next meeting of the Cobus Creek Watershed Diagnostic Study steering committee will be upon completion of data collection and during the development of management recommendations in fall of 2016.



Attachment A

Site Number	Date	Drainage Area	Flow Condition	Flow	Temp	D.O.	pH	Turb.	Cond.	BOD	Cl-	E.coli	Chl A	NO3	NH3	TKN	Ortho P	TP	TSS	TDS
				cfs	C	mg/l	SU	NTU	uS	mg/l	mg/l	cfu/100	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
1	5/20/2016	23,412.5	Base	18.0	13.6	10.5	7.9	1	530	1	42	41	6	0.75	0.06	0.60	0.09	0.11	1	510
2	5/20/2016	5,517.2	Base	2.8	13.8	9.8	7.9	1	505	1	38	46	10	0.43	0.06	0.70	0.10	0.12	1	500
3	5/20/2016	15,855.1	Base	11.0	14.9	9.8	8.0	1	480	7	36	72	7	0.43	0.05	0.70	0.08	0.10	1	480
4	5/20/2016	4,788.0	Base	0.9	14.2	10.2	7.8	1	430	2	34	55	8	1.50	0.05	0.60	0.07	0.08	1	450
5	5/20/2016	2,254.1	Base	4.0	17.3	9.6	8.0	1	510	2	40	48	14	0.57	0.06	0.70	0.09	0.12	1	510
6	5/20/2016	11,067.1	Base	9.0	18.0	9.7	8.1	1	370	1	32	49	15	0.23	0.04	0.80	0.05	0.07	1	380
7	5/20/2016	1,739.4	Base	2.0	16.2	9.5	7.8	1	530	8	42	42	11	0.50	0.05	0.60	0.10	0.13	1	520
8	5/20/2016	8,920.7	Base	6.0	18.6	9.1	8.0	1	380	13	32	90	10	0.25	0.05	0.50	0.08	0.09	1	390
9	5/20/2016	6,750.4	Base	5.0	16.6	9.1	8.0	1	410	11	34	64	8	0.43	0.06	0.60	0.07	0.08	1	420
10	5/20/2016	2,782.1	Base	0.1	13.7	9.4	7.5	1	320	3	30	1	18	0.24	0.06	0.50	0.11	0.13	1	340
11	5/20/2016	2,609.5	Base	2.0	18.2	8.8	7.8	1	560	1	44	10	7	3.50	0.06	0.70	0.08	0.10	3	560
12	5/20/2016		Base	79.0	17.7	9.4	8.1	1	500	1	40	46	10	0.95	0.05	0.60	0.06	0.08	4	500
			Target:			>4	6-9	15	1050			235		2.00	0.21	2.30	0.03	0.08	15	

Above Target

Water Quality Targets

Parameter	Target	Source
Dissolved Oxygen	> 4 mg/L	327 IAC 2-1-6
pH	> 6 or < 9	327 IAC 2-1-6
Turbidity	< 15 NTU	IDEM Hoosier Riverwatch threshold
Escherichia coli	< 235 CFU/100 ml per single sample	327 IAC 2-1.5-8
NO_3 (Nitrate)	< 2.00 mg/L	Dodds et al (1998), eutrophication threshold
NH3 (Ammonia)	< 0.21 mg/L	327 IAC 2-1-6
TKN (Total Nitrogen)	< 2.30 mg/L	Calculated based on NO_3 & NH_3 target values
Orthophophates	< 0.03 mg/L	Ohio EPA (1999), threshold of negative biological impacts
Total Phosphorus	< 0.08 mg/L	Dodds et al (1998), eutrophication threshold
Total Suspended Solids	< 15 mg/L	Dodds et al (1998), threshold for healthy aquatic life
Total Dissolved Solids	< 750 mg/L	MI – R.323.1051 / 327 IAC 2-1-6

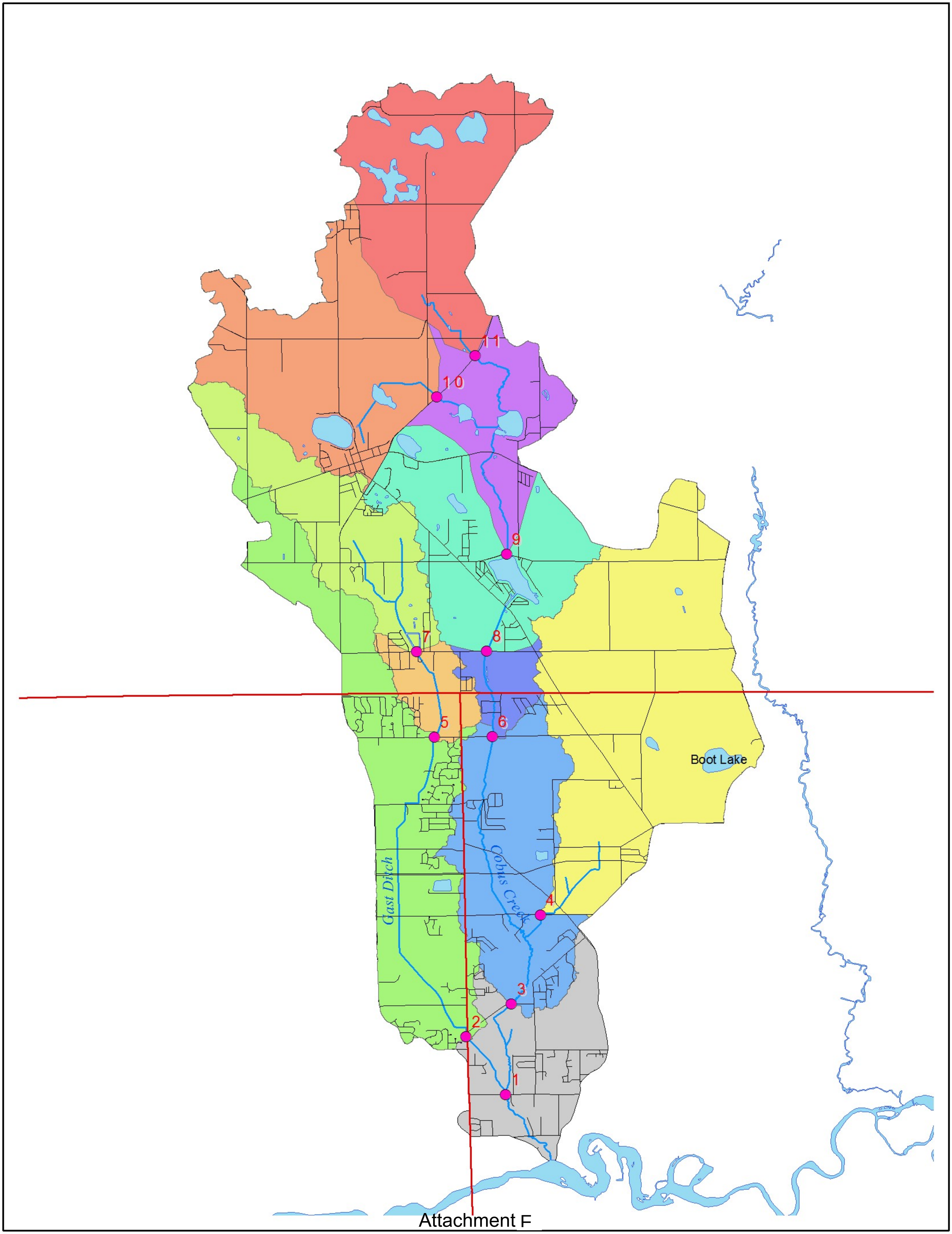
Site Number	Date	Drainage Area	Flow Condition	Flow	NO3 Load	NH3 Load	TKN Load	Ortho P Load	TP Load	TSS Load	TDS Load
				cfs	kg/d	kg/d	kg/d	kg/d	kg/d	kg/d	kg/d
1	5/20/2016	23,412.5	Base	18.0	33.01	2.64	26.41	3.96	4.84	44.01	22,446.2
2	5/20/2016	5,517.2	Base	2.8	2.94	0.41	4.79	0.68	0.82	6.85	3,423.2
3	5/20/2016	15,855.1	Base	11.0	11.57	1.34	18.83	2.15	2.69	26.90	12,910.2
4	5/20/2016	4,788.0	Base	0.9	3.30	0.11	1.32	0.15	0.18	2.20	990.3
5	5/20/2016	2,254.1	Base	4.0	5.57	0.59	6.85	0.88	1.17	9.78	4,988.0
6	5/20/2016	11,067.1	Base	9.0	5.06	0.88	17.60	1.10	1.54	22.01	8,362.3
7	5/20/2016	1,739.4	Base	2.0	2.45	0.24	2.93	0.49	0.64	4.89	2,542.9
8	5/20/2016	8,920.7	Base	6.0	3.67	0.73	7.34	1.17	1.32	14.67	5,721.6
9	5/20/2016	6,750.4	Base	5.0	5.26	0.73	7.34	0.86	0.98	12.23	5,134.8
10	5/20/2016	2,782.1	Base	0.1	0.06	0.01	0.12	0.03	0.03	0.24	83.1
11	5/20/2016	2,609.5	Base	2.0	17.12	0.29	3.42	0.39	0.49	14.67	2,738.5
12	5/20/2016		Base	79.0	183.51	9.66	115.90	11.59	15.45	772.66	96,582.2

(red)	Highest Loading of Sample Sites
(orange)	2nd Highest " "
(green)	3rd Highest " "

Attachment D

Site Number	Date	Drainage Area	Flow Condition	Flow	NO3 Yield	NH3 Yield	TKN Yield	Ortho P Yield	TP Yield	TSS Yield	TDS Yield
				cfs	g/d-ac	g/d-ac	g/d-ac	g/d-ac	g/d-ac	g/d-ac	g/d-ac
1	5/20/2016	23,412.5	Base	18.0	1.41	0.11	1.13	0.17	0.21	1.88	959
2	5/20/2016	5,517.2	Base	2.8	0.53	0.07	0.87	0.12	0.15	1.24	620
3	5/20/2016	15,855.1	Base	11.0	0.73	0.08	1.19	0.14	0.17	1.70	814
4	5/20/2016	4,788.0	Base	0.9	0.69	0.02	0.28	0.03	0.04	0.46	207
5	5/20/2016	2,254.1	Base	4.0	2.47	0.26	3.04	0.39	0.52	4.34	2213
6	5/20/2016	11,067.1	Base	9.0	0.46	0.08	1.59	0.10	0.14	1.99	756
7	5/20/2016	1,739.4	Base	2.0	1.41	0.14	1.69	0.28	0.37	2.81	1462
8	5/20/2016	8,920.7	Base	6.0	0.41	0.08	0.82	0.13	0.15	1.64	641
9	5/20/2016	6,750.4	Base	5.0	0.78	0.11	1.09	0.13	0.14	1.81	761
10	5/20/2016	2,782.1	Base	0.1	0.02	0.01	0.04	0.01	0.01	0.09	30
11	5/20/2016	2,609.5	Base	2.0	6.56	0.11	1.31	0.15	0.19	5.62	1049

(red)	Highest Loading of Sample Sites
(orange)	2nd Highest " "
(green)	3rd Highest " "



Attachment F

COBUS CREEK WATERSHED DIAGNOSTIC STUDY

SJRBC
St. Joseph River Basin Commission

Steering Committee Meeting: 6/28/2016

Agenda

- Where We Are At
- Historic Watershed Data
- New Data Collected
- Next Steps

Where We Are At

A brief overview

Where We Are At

- Purpose of Cobus Creek Watershed Diagnostic Study
  - Describe water quality trends in Cobus Creek
  - Identify potential water quality problems
  - Propose potential environmental improvement projects

Winter 2015	Summarize historical watershed data
Spring 2016	In-the-field data collection
Summer 2016	
Fall 2016	Analyze/model data & develop recommendations
Winter 2016	
Spring 2017	Final document approved

Where We Are At

- Purpose of Cobus Creek Watershed Diagnostic Study
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Winter 2015	Summarize historical watershed data
Spring 2016	
Summer 2016	In-the-field data collection
Fall 2016	
Winter 2016	Analyze/model data & develop recommendations
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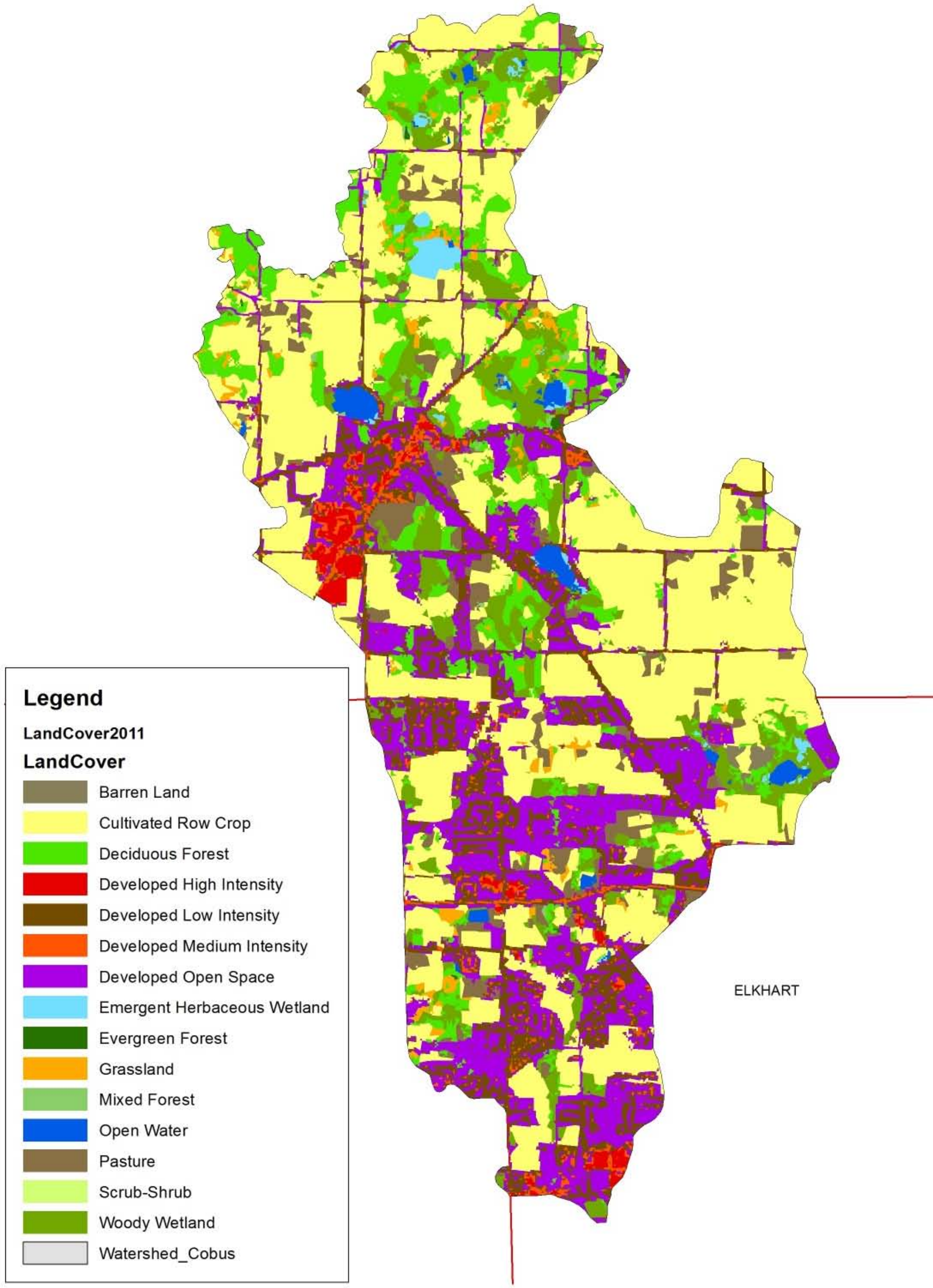
Historic Watershed Data

A sample of data currently available

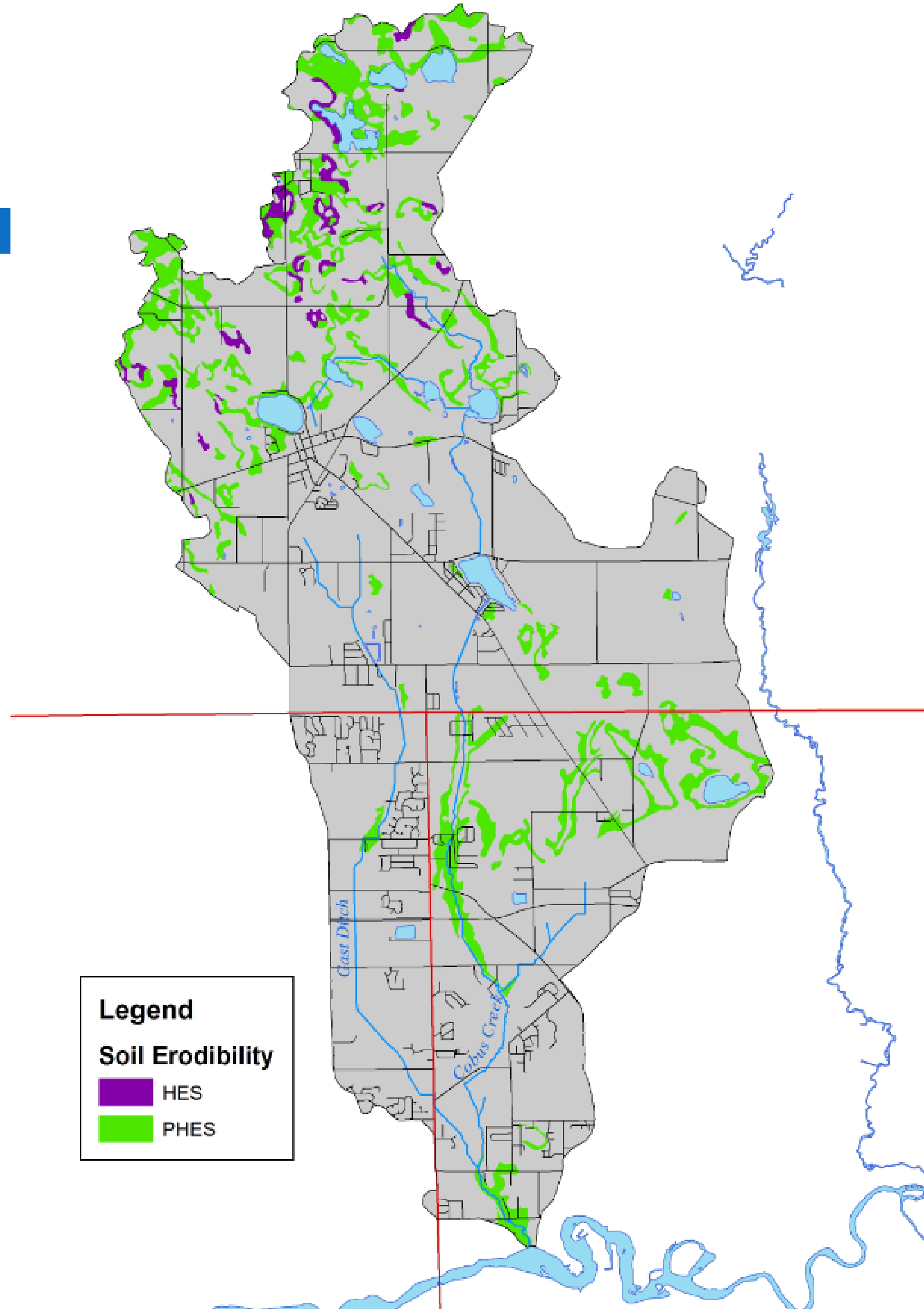
Landuse

- 40% cultivated cropland
- 32% development
  - Low & open
- 12% forest
- Low and medium development intensity being analyzed



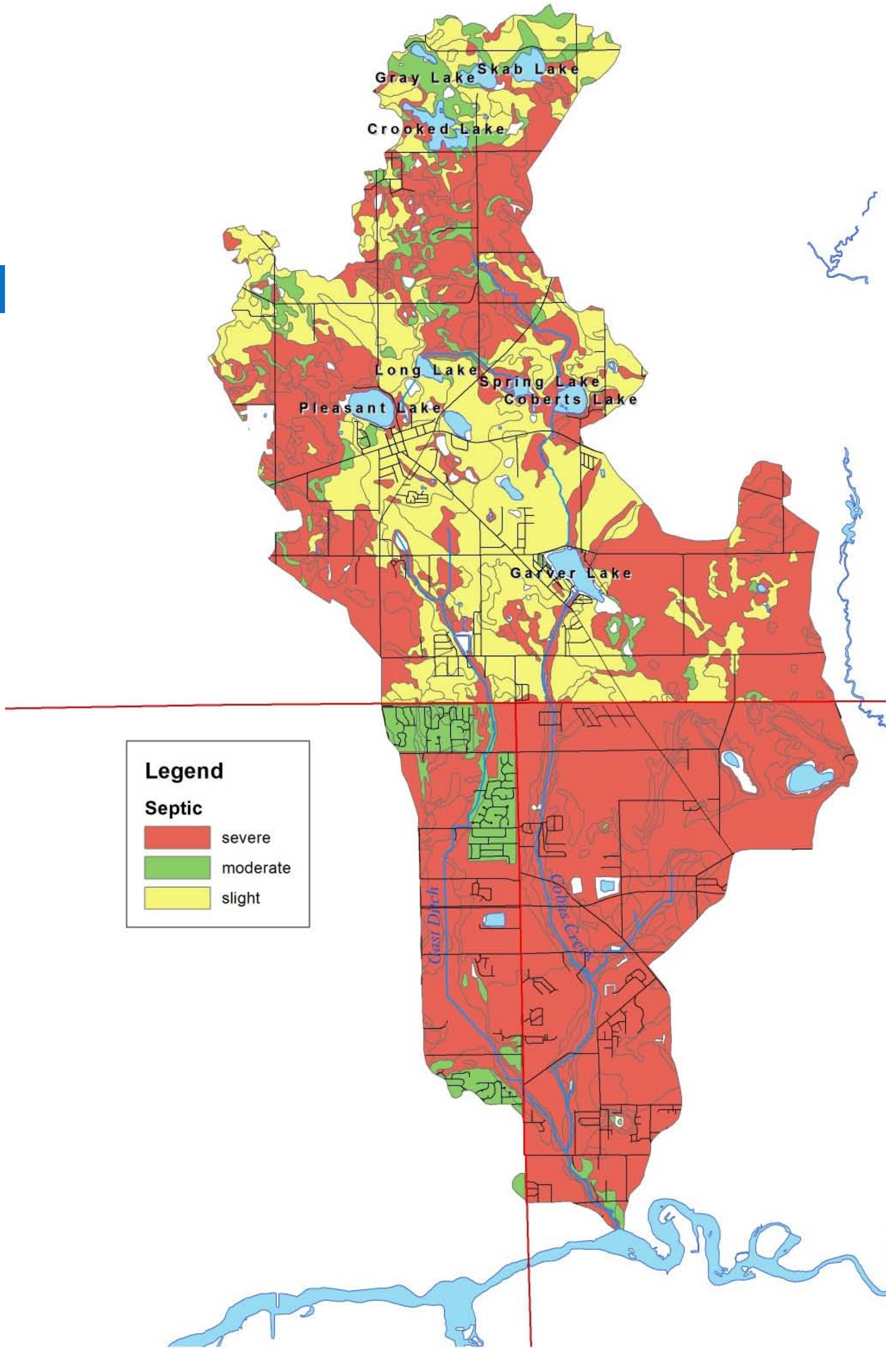
Soil Erodibility

- (P)HES – (potentially) highly erodible soils
  - How likely is a soil to be carried away by water, wind, other disturbances?
- (P)HES focused near waterways can be a concern
- HES focused in headwaters
- Long stretch along Cobus bank PHES



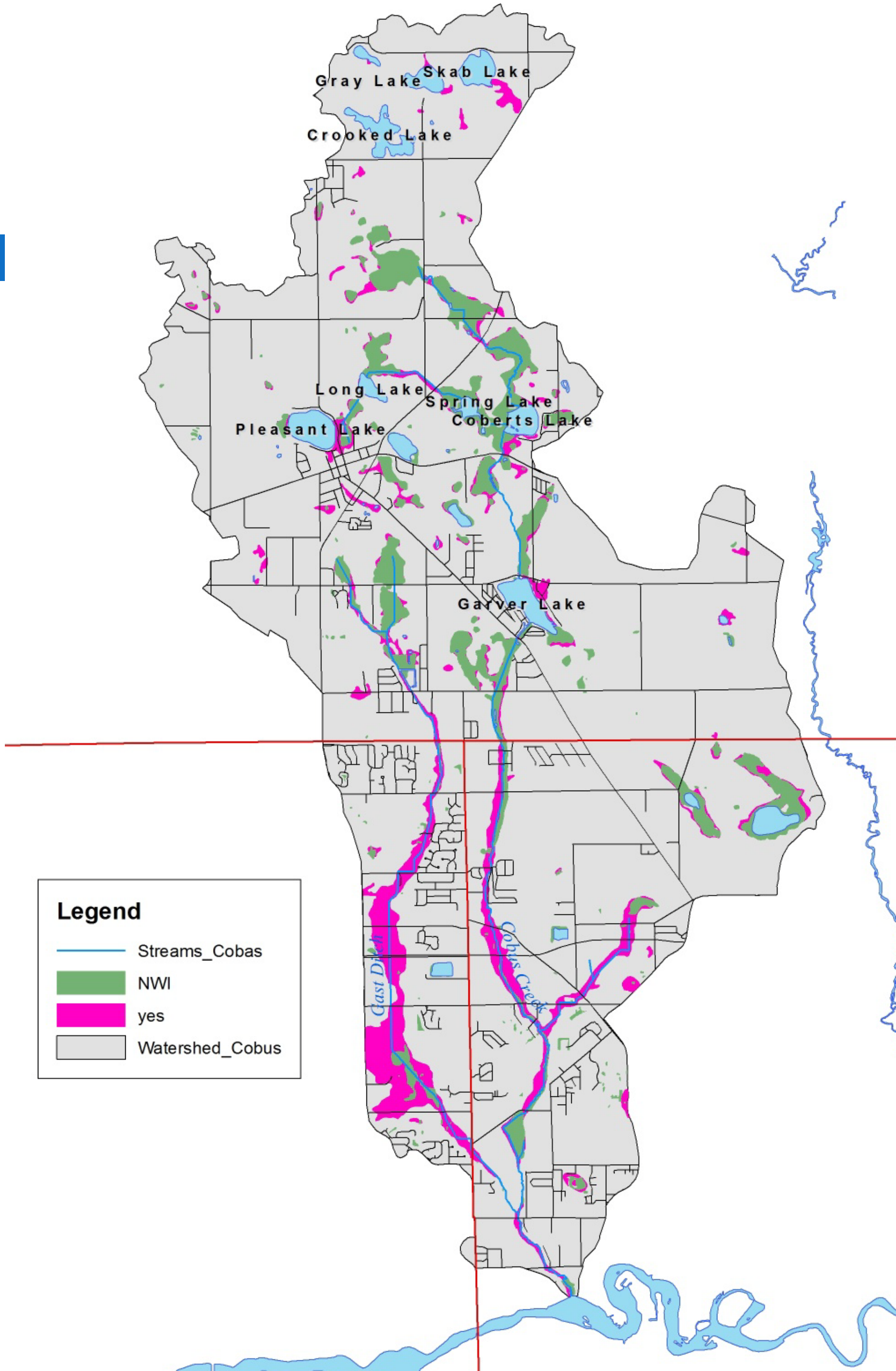
Septic Limitations

- 62% of watershed has soils not suitable for septic
  - Concerns when paired with lots too small for on-site treatment
- Currently analyzing portions of watershed on septic/sewer



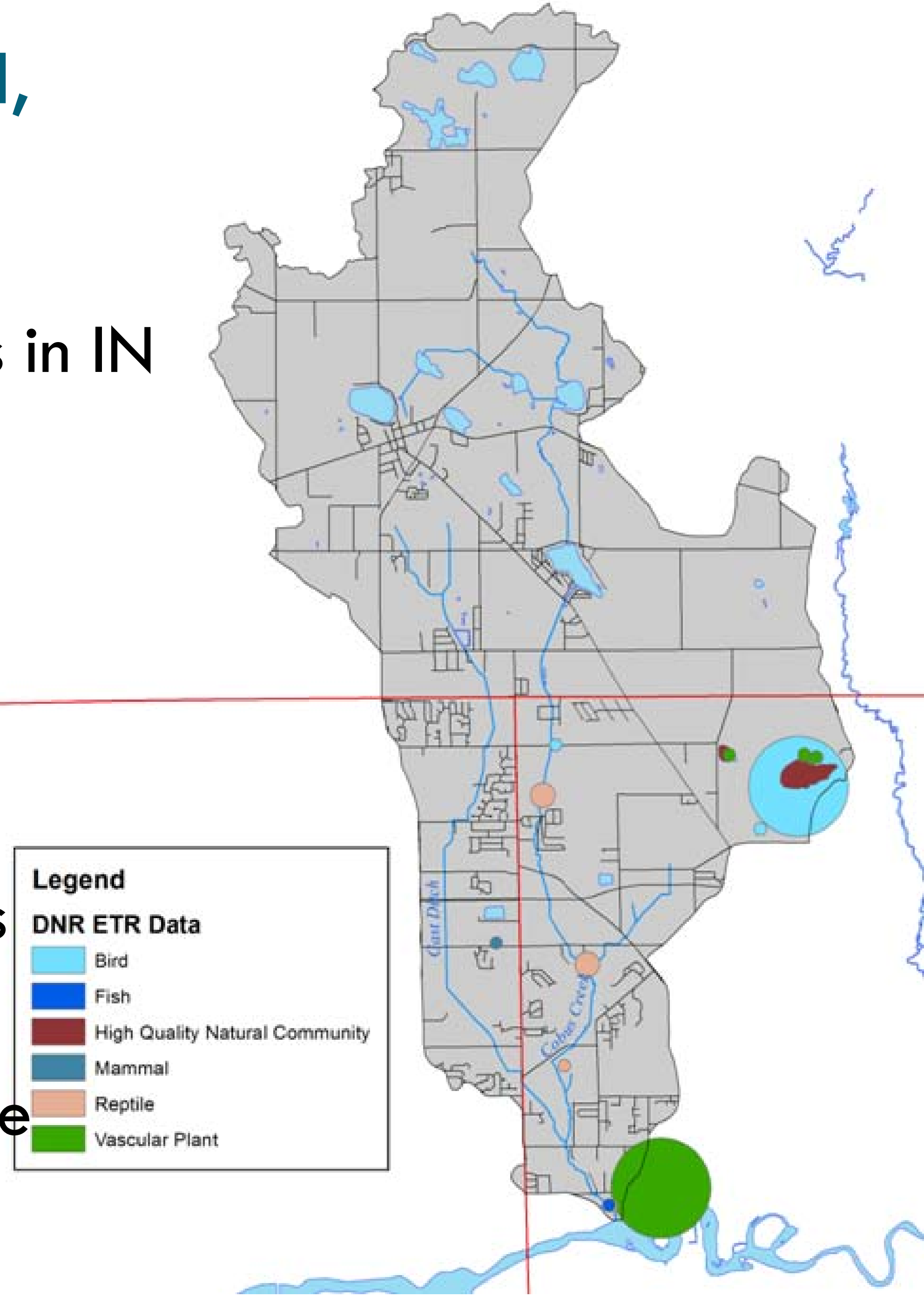
Wetlands

- 62% retention of pre-settlement wetlands
- Many in headwaters
- Primary losses
  - Fish, amphibian, bird habitats
  - Focused along Cobus & Gast Ditch channels



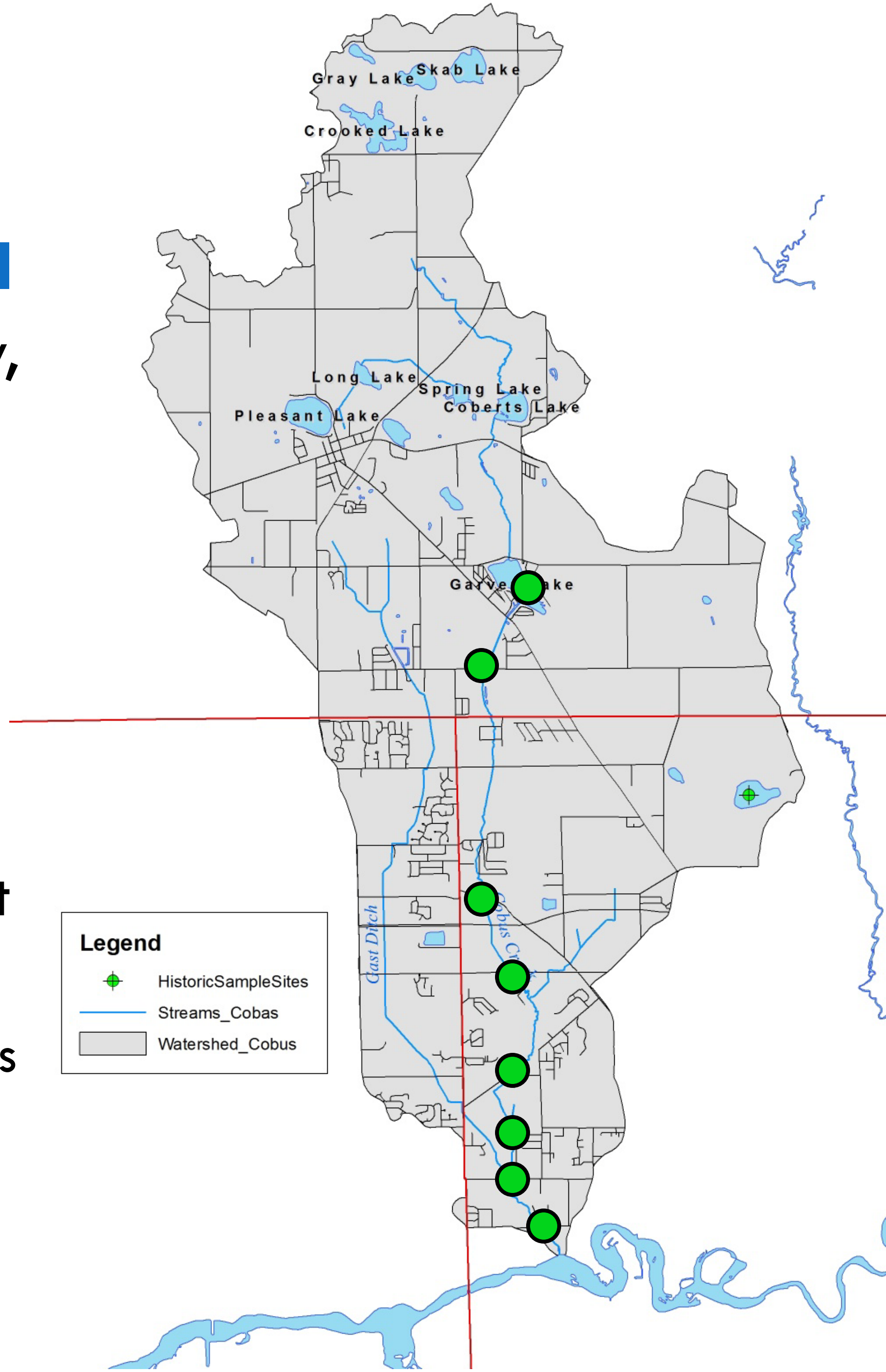
Endangered, Threatened, Rare Species

- 15 ETR species sightings in IN
  - 6 plants
  - 4 reptile
  - 3 bird
  - 1 mammal
  - 1 fish
- 2 High Quality Habitats
  - Boot Lake NP
- Looking for MI database



Monitoring Data

- IDEM, Elkhart Aquatic Biology, Elkhart County Health, Michigan DNR, Hoosier River Watch
- Inconsistent sampling locations & events
- Chemistry primarily on Cobus
- Water chemistry seems decent
  - DO, temp, conductivity good
  - Total Phosphorus & E. coli spikes
  - pH samples have exceeded state standard (9.0)

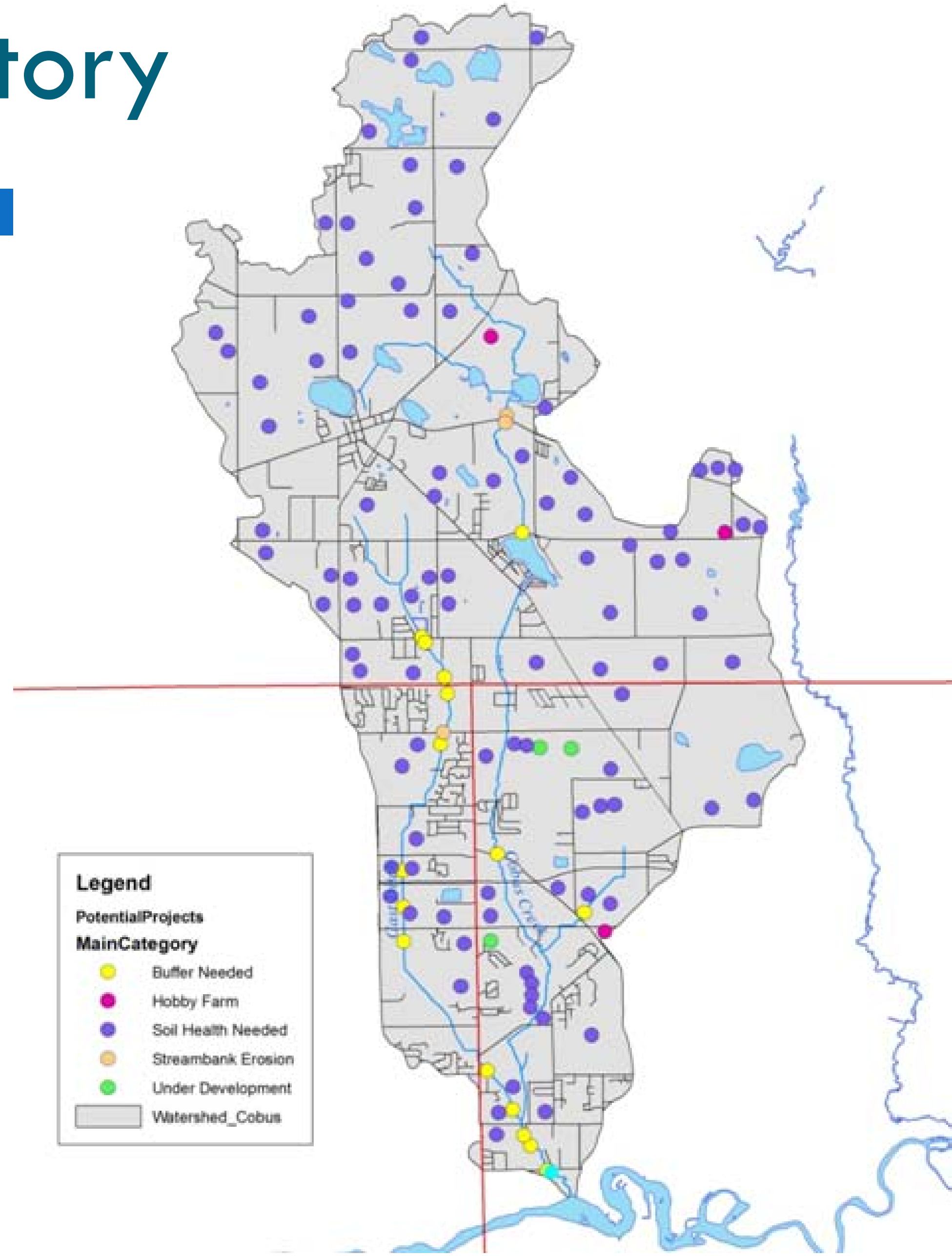


New Data Collected

What we are finding!

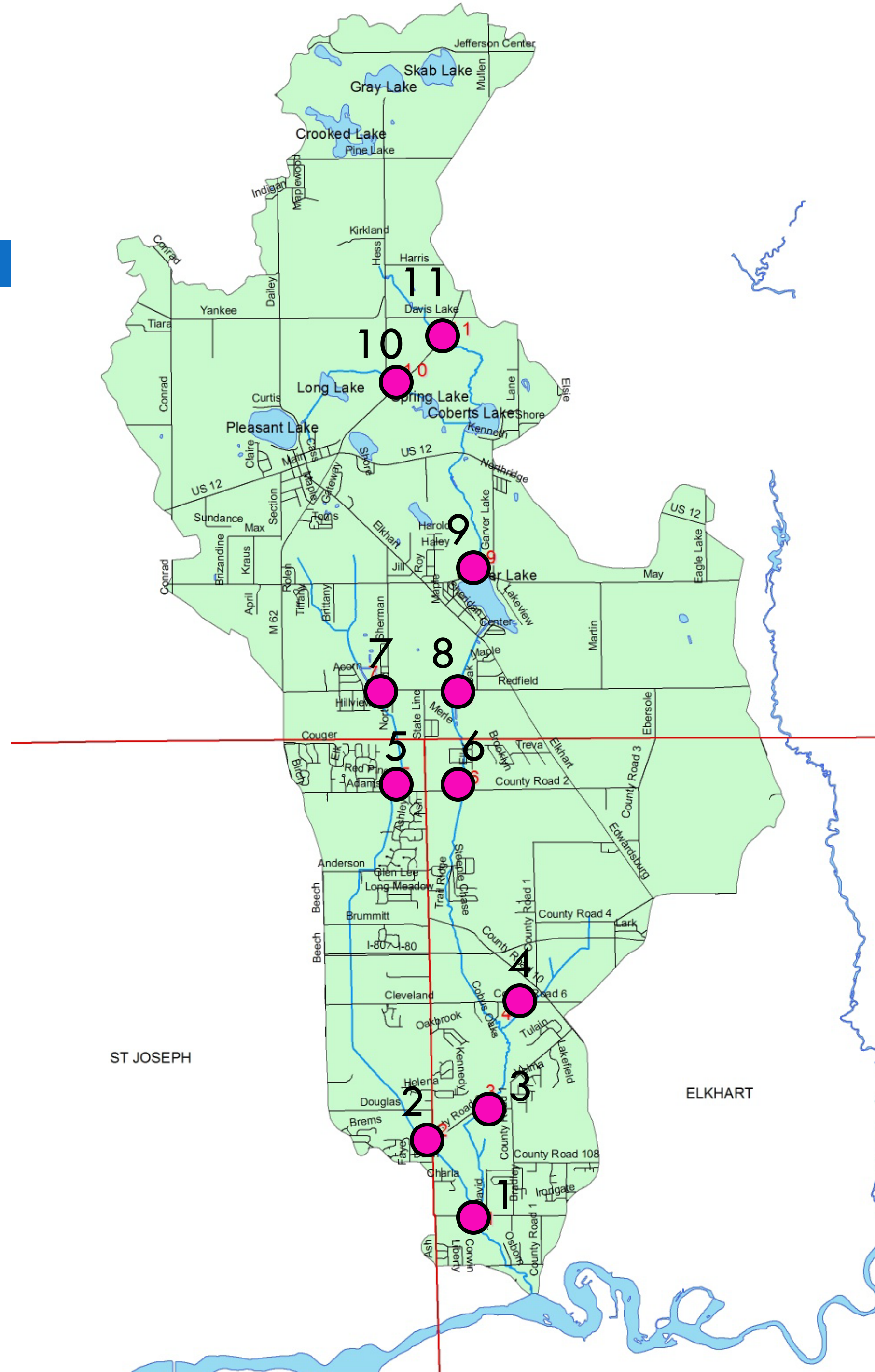
Watershed Inventory

- 8,270 acres agriculture BMPs
- 0.9 miles bank stabilizations
- 3.2 miles riparian buffers
- Cobus Creek County Park staff doing lots for fish habitat and bank stabilizations
- More site visits scheduled
  - Public Access Sites
  - Edwardsburg
  - Elkhart Conservation Club



Water Sampling

- 11 Sites
- Chemical & Aquatic Organism Sampling
  - 2 chemical samples (b/w)
  - 1 organism sample
    - Fish & macroinvertebrates
- Work completed
  - 1 chemical sample (b)
  - Fish samples



Aquatic Sampling Results (so far) 1

- Fish diversity & stream health better closer to St. Joseph River
- Sensitive fish species in lower ends of Cobus
  - CR 12 & CR 8
  - Signs of trout reproduction

Brown Trout – Cobus Creek @ CR12 - Elkhart

Bowfin – Cobus Creek & Redfield Rd.

Aquatic Sampling Results (so far) 2

- Gast Ditch & Cobus east lateral have significantly impaired fish communities
- Biggest limitation for fish is habitat degradation
  - Channelized segments of Cobus
  - Dams and perched culverts fragmenting fish communities

Bluegill – Gast Ditch

Perched culvert on Cobus @ CR 2

Aquatic Sampling Results (so far) 3

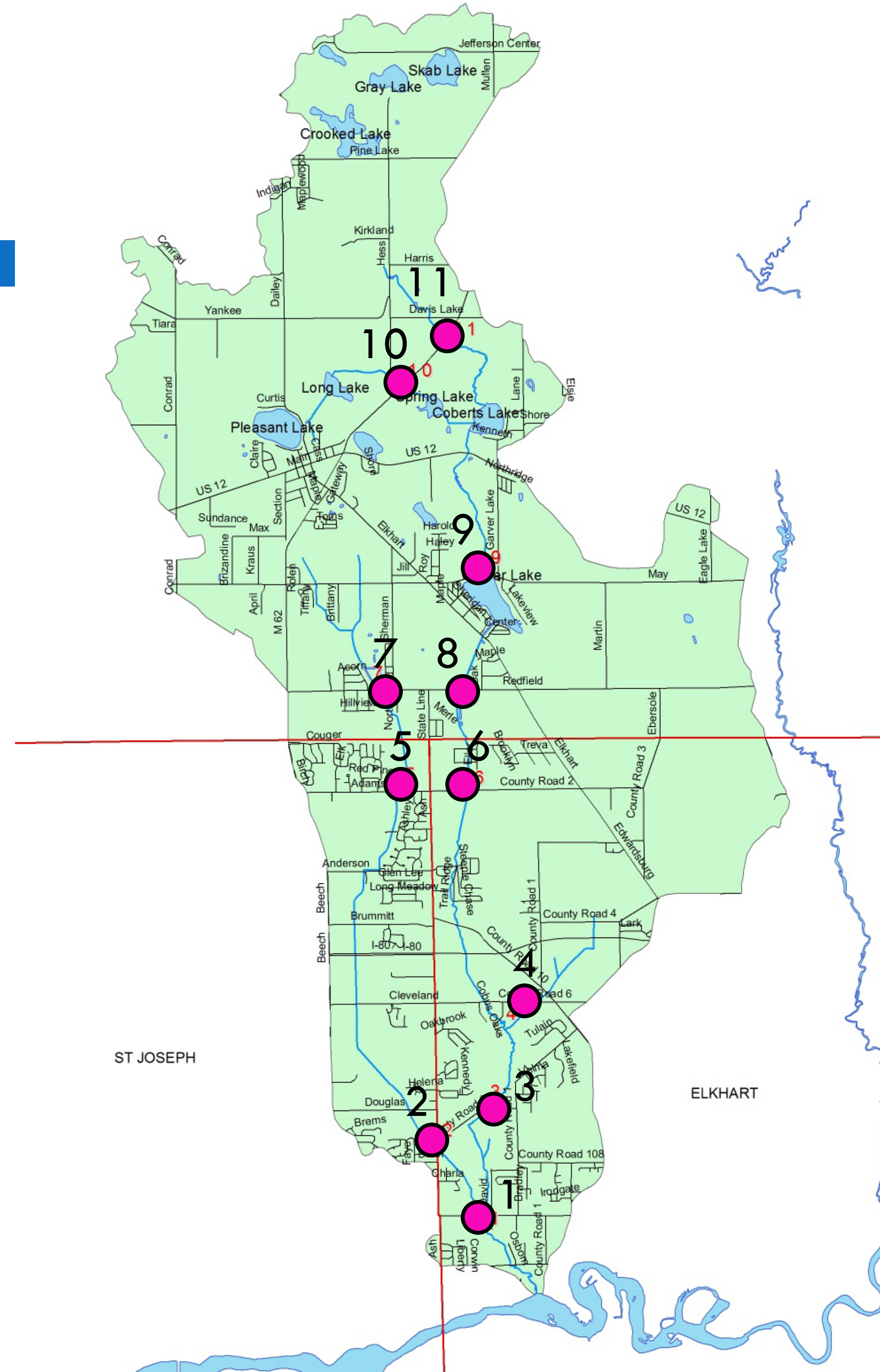
- Upper reaches of watershed host warmwater species
  - Esp lake outlets
- Main stem Cobus hosts coolwater species
- Macroinvertebrate sampling to come

Central mudminnow – Cobus latteral

Storm drain discharging to Cobus Creek

Chemical Sampling Results (so far) 1

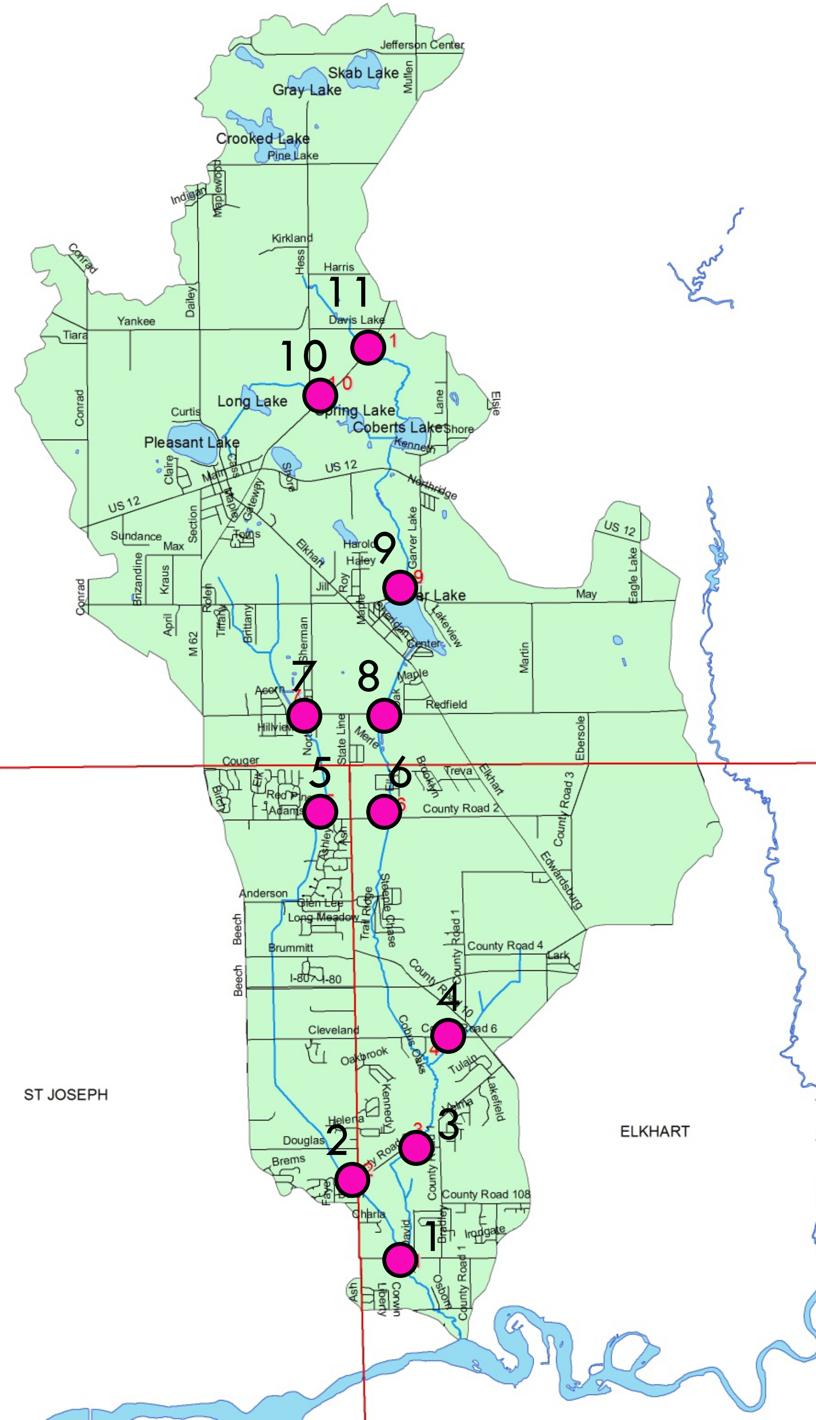
- 1 Chemical Sample
  - Baseflow
- Parameters of initial concern
  - Orthophosphate – all
  - Total Phosphorus – most
  - NO_3 – Site 11
- Overall: Not too bad
- Wet weather sample taken later in summer



Chemical Sampling Results (so far) 2

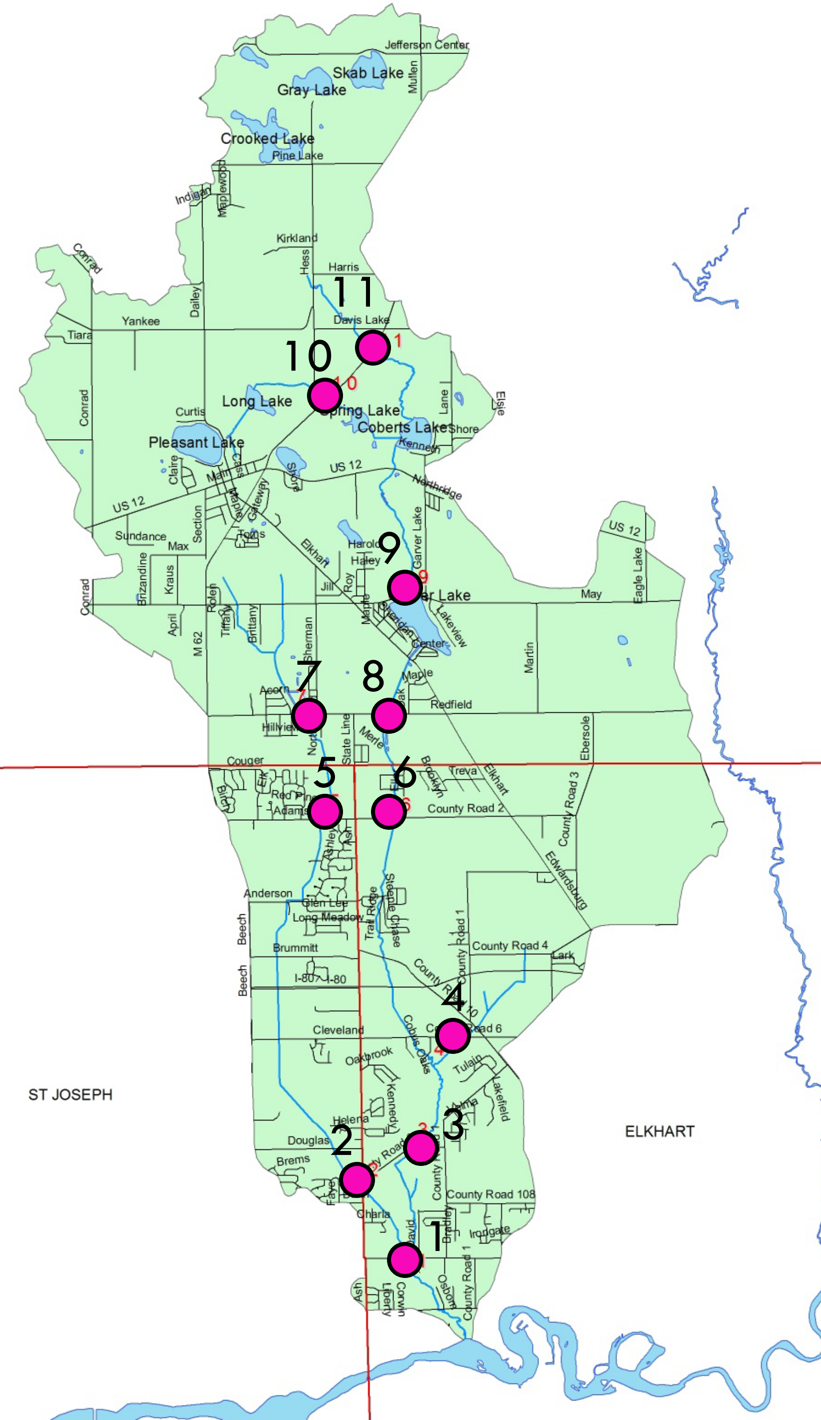
- Load = concentration x flow
- Compare amounts of pollutants between sites

- Loading concentrations generally consistent with flow
  - Site 1 – highest loading
  - Site 3 – *second* highest
- A few interesting findings…
  - Site 11 – second NO_3
  - Site 8 – third orthophosphate



Chemical Sampling Results (so far) 3

- Pollutant "yields"
  - Yield = load/drainage area
  - Grams/day per acre
  - Compare concentrations of pollutants on land
- Identifies sites susceptible to bringing lots of pollution into waterways
- Gast Ditch - highest yields
  - Sites 5 & 7
- Additional findings…
  - Site 11 – NO_3 & TSS
  - Site 1 – a few highs

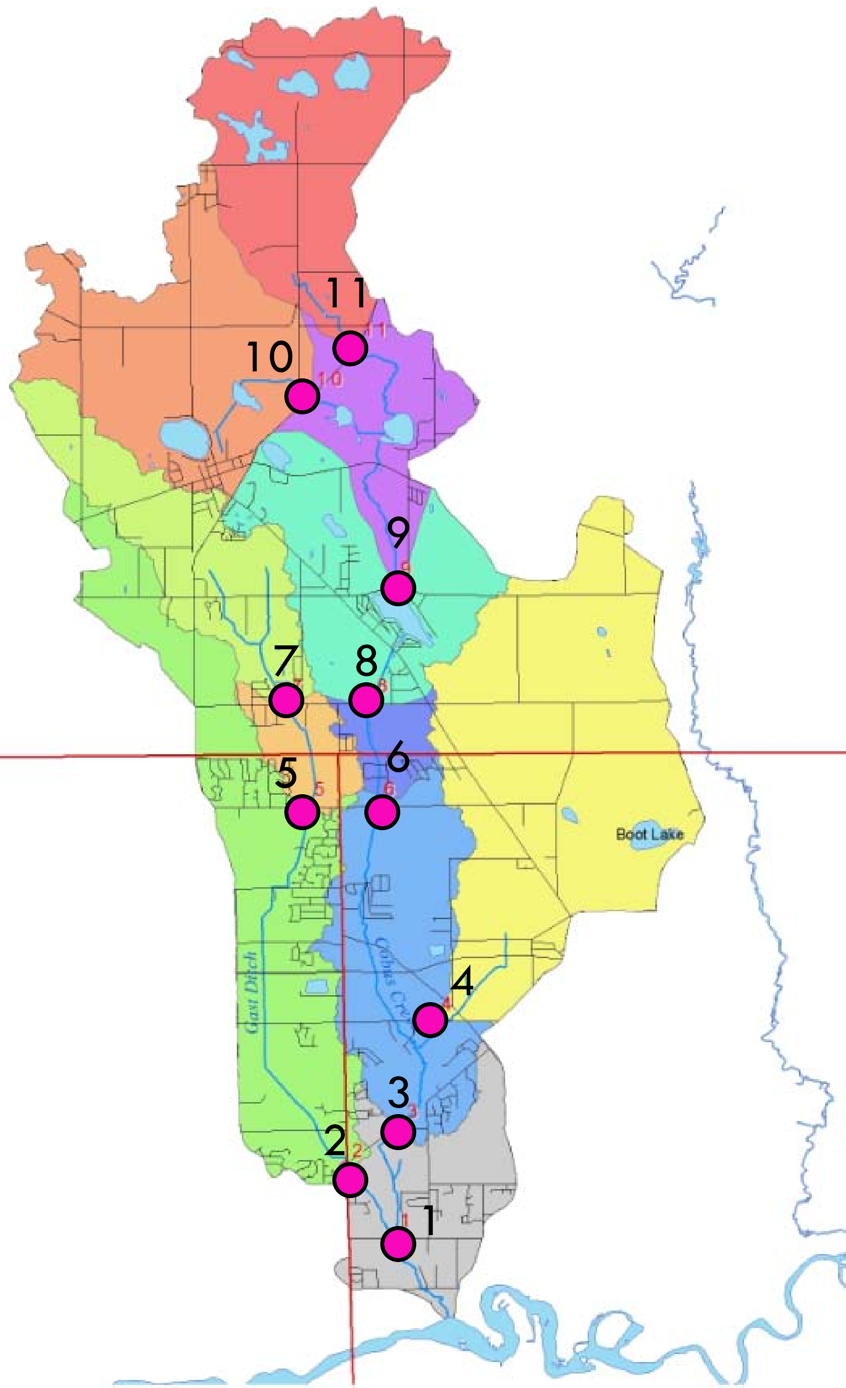


Chemical Sampling Caveats

- Will have a better understanding of water quality trends after we get stormflow chemical samples & macroinvertebrates
- Sites with highest loads & yields not necessarily mean there is serious water quality issue
- Some target pollutant thresholds are high standards
- There may not be a "precise" answer to all issues

Subwatershed Characteristics

- Breaks up watershed to analyze resources
  - Landuses
  - Fish & Wildlife
  - Wetlands
    - Site 9 – 342ac wetlands (97%)
    - Site 2 – 85% wetland loss
  - Soil erodibility
    - Site 10 - ~40% (P)HES
  - Septic limitations
    - Site 3 – 97% severe limited
- Will help us prioritize management efforts



Next Steps

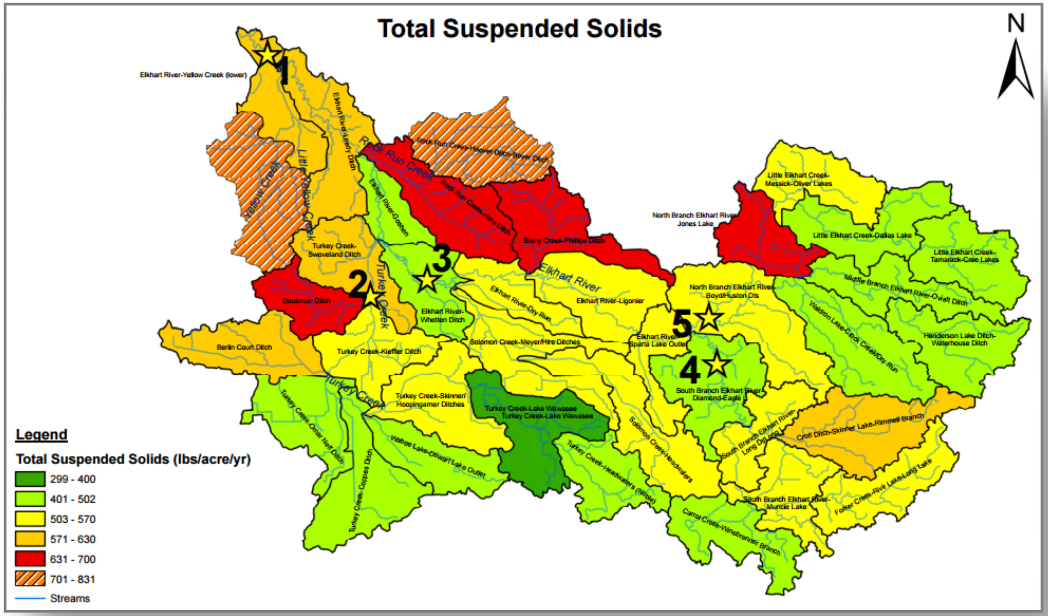
Great things to come!

Next Steps – Field Work

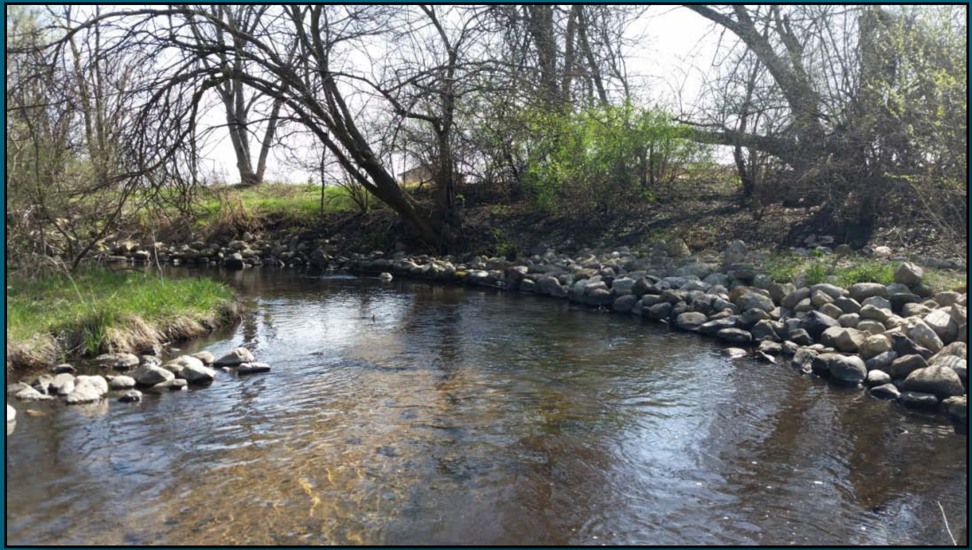
- More in-the-field work
  - 1 wet weather chemical sampling
  - Finishing aquatic organism sampling
  - Aquatic organism stream crossing passage assessment
  - Additional site investigations/habitat assessments

Next Steps – Report Compilation

- Analyze all field samples and natural resources data
- Model pollutants in subwatersheds
- Identify & prioritize management recommendations
- Draft report
- Final report



Questions?



COBUS CREEK WATERSHED DIAGNOSTIC STUDY