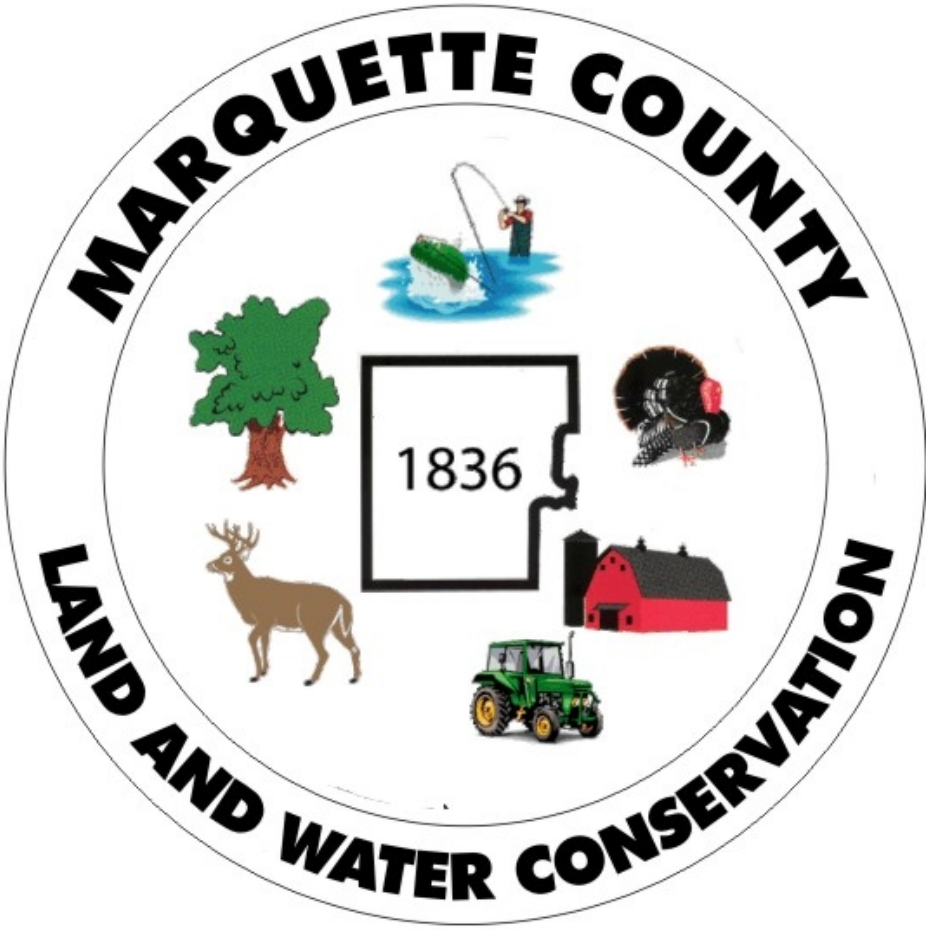
Marquette County
Land and Water Resource Management Plan



2020-2029

Complied by:

Marquette County Land and Water Conservation Department

Marquette County
Land and Water Resource Management Plan

2020

Prepared under the jurisdiction of the Marquette County Land and Water Conservation Committee

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Chapter One
Plan Development Process

Non-Point Source Pollution is one of the major threats to the natural resources of Marquette County. In the past, different state programs have been developed to try and slow the progress of this environmental threat. In 1996 the legislature ordered a re-design of the state's non-point source programs. While the re-design process was being developed, Land and Water Conservation Professionals throughout the state came up with an idea of a locally driven/county wide, resource management plans.

In 1998, legislation opened the door for each county to develop a management plan on a "locally led" idea to preserve and enhance the water quality resources of their county. This (new tool in 1999) would become known as the Land and Water Resource Management Plan (LWRM). Since inception, the LWRM has been updated every five years to reflect changing trends, state/local regulations and resource changes.

Citizen Participation

The Citizen Advisory Committee (CAC) convened in July 2019 prior to plan development and again in November 2019. Identifying local resource concerns was addressed first by reviewing issues identified through previous (1999 and 2014) LWRM plans and current issues in the County. These issues were prioritized by the importance of the issue and the ability to address the concern with realistic expectations.

The Primary Environmental Resource Concerns of the County include:

- Lakes
    a. non-point run-off (bank erosion, near shore disturbance)
    b. Septic System Maintenance

- Development/Construction
    a. zoning/land use planning
    b. development/construction site erosion

- Water Quality/Non-point Pollution
    a. agricultural run-off
    b. storm water run-off
    c. Groundwater Quantity and Quality

Local Approvals & Public Hearings

A public Hearing was held on November 19th, 2019 and was approved by the Land Conservation Committee at the November 19th committee meeting. The Final LWRM Plan will be presented to the Marquette County Board of Supervisors for approval at their January 2020 monthly meeting.

Related Resource Management Plans

In developing this Land and Water Resource Management Plan, issues, concerns, needs, goals and objectives from many existing natural resource management plan documents were reviewed. All of those documents are listed in the reference section of this plan. There are a number of key documents with specific data, observations and objectives that served a larger role as they relate to this plan. These include:

- Neenah Creek Priority Watershed Plan (1994)
- State of the Upper Fox Basin Plan (2001)
- Marquette County Farmland Preservation Plan (2015)

- Total Maximum Daily Load Plan for the Upper Fox & Wolf Basins (draft, 2018)
- County Comprehensive Land Use Plan (2015)

Inter-Agency Participation
Agency participation played a crucial part in the development of the Marquette County Land and Water Resource Management Plan. Several agencies were consulted throughout plan development regarding certain aspects of the plan. Portions of the plan were also written by agency staffs, which specialize, in certain areas. If staff did not write or edit portions of the plan, they were given time to review and comment on draft copies. The participating agencies include:

- UW Extension
- Wis. Dept. of Natural Resources (TMDL, NR151)
- U.S. Fish and Wildlife Service
- Natural Resource Conservation Service (NRCS)
- Farm Service Agency (FSA)

A plan of this detail would not be possible without the input from these agencies.

Basin Wide/County to County Coordination
Watershed boundaries, unfortunately, do not follow county boundaries. When planning for water quality, it is imperative to look past county boundaries at more of a basin approach. This is important because Marquette County lies completely in the Upper Fox River Basin, sharing watersheds directly with Adams, Waushara, Columbia and Green Lake Counties. During plan development, communication between neighboring counties was used to plan by a watershed basis. Staff from the Department of Natural Resources requested the LWRM use the basin/watershed approach.

The Department of Natural Resources, *The State of the Upper Fox Basin Plan*, was completed in 2001. The Basin Plan and the LWRM plan share similar water quality goals and objectives. In consultation with the DNR Staff in writing the LWRM plan, common water quality priorities were identified. The Department of Natural Resources water quality priorities from the *State of the Upper Fox Basin Plan* include:

- Continued implementation of the Winnebago Comprehensive Management Plan.
- Limit nutrient, sediment, and organic loading to waterways from point & non-point sources.
- Update formal stream classifications (NR104).
- Provide information and education on animal waste management to the agriculture industry.
- Conduct habitat evaluation on dredged streams.
- Participate in the Smart Growth Initiative with local governments.
- Reduce the discharge of untreated storm water to waters of the state.
- Provide information & education to construction industry on sediment control requirements.
- Reduce stream fragmentation by construction fish passage structures on three dams by 2003.
- Remove Governor's Bend, Grand River, and White River dams on the Fox River by 2004.
- Remove an additional three dams in the basin by 2006.
- Develop a protocol for alternatives analysis for new dam construction by 2001.
- Provide information and education on aquatic exotic species that currently exist in the basin as well as those that may be introduced to the basin. In order to keep resource concerns a priority throughout the Basin, copies of the LWRM Plan will be made available to neighboring counties and a request will be made for Marquette County to receive copies of their respective plans.

Chapter Two
General County Information, Natural Resources and Trends

General County Overview

Marquette County, located in South Central Wisconsin has a total land area of 457 square miles or 292,480 acres. Out of the total acreage, approximately 95,000 acres is forested, 86,000 acres is cropland and 6,075 acres is surface water (lakes and streams). The entire county lies within the Upper Fox River Basin.

Marquette County consists of fourteen townships. Montello, located in the east central part of the county, serves as the County Seat. Population in 2008 was 15,423 people and has seen a rise of about 800 more people since 2004. Proximity to the City of Madison has made Marquette County an ideal location for people to relocate to.

Local Plans and Ordinances

This portion of the plan will list all other "local" or significant plans or ordinances that will directly or indirectly have an affect on the Land and Water Resource Management Plan.

County Comprehensive (Land-Use) Plan (updated 2015)

The purpose of the Marquette County Comprehensive Plan is to help guide decision-making by:

- Identifying areas appropriate for development and preservation over the next 20 years.
- Recommending types of land uses for specific areas in the County, guided by participating towns, villages, and the City. Local planned land use maps were brought together to form Marquette County's planned land use map.
- Identifying needed transportation and community facilities to serve future land uses.
- Setting forth detailed strategies to grow Marquette County's economy and increase quality of life.
- Providing detailed strategies to implement recommendations.

This Plan was prepared under the State of Wisconsin's comprehensive planning legislation contained in Section 66.1001 of Wisconsin Statutes. This Plan meets all statutory requirements of the State law. In accordance with Wisconsin Statutes, all zoning and subdivision ordinances and land use decisions undertaken by the County must be consistent with this Plan, as it may be amended over time.

This Comprehensive Plan also contains an update to the 1982 Marquette County Farmland Preservation Plan, under Chapter 91 of Wisconsin Statutes. The farmland preservation component is intended to guide the County's actions to preserve agricultural land and activity, particularly within those towns that chose to designate "farmland preservation areas" over at least parts of the town area. As suggested by the graphic to the right, there is a significant amount of overlap between required comprehensive plan and farmland preservation plan elements, and under Chapter 91 the farmland preservation plan is supposed to be adopted as an element of county comprehensive plans. The required farmland preservation plan elements are mainly contained in the Agricultural Resources and Land Use chapters, but also extend into other chapters. Like in 2005, this updated Comprehensive Plan was prepared in cooperation with Marquette County's towns, villages, and the City of Montello.

Farmland Preservation Plan
The County Farmland Preservation Plan was updated in 2015 (see previous section) as part of the Comprehensive Land Use Plan revisions. Updating this plan meets State Requirements enabling Landowners to be eligible to enroll in the Farmland Preservation Program and benefits of Income Tax Credit.

Wisconsin's Farmland Preservation Program helps farmers and local governments preserve farmland, protect soil and water, and minimize land use conflicts. Marquette County has 89,345 acres *(see table 5-1)* in Farmland Preservation District (Ag. 1 Zoning) making those acres eligible for FPP tax credit. Of those total eligible acres, 21,635 acres (68 participants) are currently enrolled in the program.

Animal Waste Storage Ordinance
Marquette County approved its first Animal Waste Storage Ordinance in 1994. The ordinance as written, has given the County Natural Resources plenty of protection over the past 15 years. However, like all things, revisions are needed to keep pace with changing state laws and standards. A full re-write of the Animal Waste Storage Ordinance is needed and will be completed in 2020.

Shoreland Zoning
In 2001 Marquette County did a complete re-write of the Shoreland Zoning Ordinance. Areas that significantly changed and that also included The Land and Water Conservation Department were:

-Vegetation Removal (protection of 35' buffer)
-Shoreline Restoration (voluntary and mitigation)
-Land Disturbing Activities
-Construction Site Erosion Control

Insuring compliance with the Shoreland Zoning Ordinance assures that Marquette County lakes and other riparian areas will continue to be protected and enhanced.

Natural Resources

Geology
The most recent glaciation of Wisconsin encompassed this area and left a variety of glacial features. The western portion of the county is covered by a thick mantle of glacial till referred to as the terminal moraine. Within the moraine, old glacial lakebeds exist, now reflected in marshland and scattered areas of red clay. The remainder of the county has a shallower mantle of drift, referred to as ground moraine, associated with large tracts of marsh deposits.

Underlying bedrock is primarily Upper Cambrian Sandstone, with limestone capping the hills in the northwestern portion of the county. In central and southern Marquette County there are places where the glacial deposits directly overly Precambrian igneous and metamorphic rocks.

Groundwater Susceptibility
Most wells, private and public draw water from the glacial sand and gravel and/or the Cambrian sandstone aquifers. The two aquifers are interconnected meaning that water moves easily between them. The upper sand and gravel aquifer is the surface material covering the entire county. It is described above in the section on geology. Where the depth to groundwater is shallow and the glacial sediments are permeable, the aquifer is susceptible to contamination from surface activities. The Cambrian sandstone aquifer is a good source of water and consists of sand grains that are loosely cemented together. Where the depth to sandstone bedrock is shallow and the glacial sediments are permeable the sandstone is more susceptible to groundwater pollution.

The soils are generally sandy because of the sandstone bedrock, which is incorporated into the glacial drift over the county. The northwestern three-fourths of the county, the soils are classed as glacial and fluvial sands or sandy loams. In the southeastern quarter, soils are classed as glacial loam. The east central portion consists of peat and muck soils supporting swamp forest and marsh vegetation. These soils are scattered throughout the county but should give a general idea of the layout of the county. See more on Groundwater Quality/Susceptibility in Chapter 3.

Wetlands

About one third of the land area of the county consists of hydric or wetland soils. A wetland is generally defined as having a predominance of hydric soils and is inundated or saturated by surface or ground water at a frequency and duration sufficient to support hydrophytic vegetation. They are somewhat poorly drained, poorly drained and very poorly drained areas of both mineral and organic soils. Some 88,040 acres are classified as hydric soils while 28,690 acres are soil units that may contain inclusions of hydric soils. These inclusions are generally too small to include in the mapping process but are valuable to wildlife, recreation, floodwater retention, flow stabilization of streams and rivers, groundwater recharge and surface/groundwater purification.

Typical hydric soils have groundwater at or near the surface and many are obvious wetlands with water above the surface throughout most of the growing season. Topography plays a critical role in formation and type of wetland. However hydric soils and wetlands can be found in any landscape position. Hydric soils are found in lowlands, low-lying drainage ways, seasonally flooded basins, old meanders and old lake basins. Springs, side hill seeps and areas of groundwater discharge may create wetlands in odd or unsuspected landscape positions. Wetland plant communities in Marquette County are commonly found in four general plant communities or complexes:
1) Meadow-Marsh-Open Water 2) River Valley 3) Lake Basin 4) Bogs.

Three major inventories exist for the identification of wetlands and wetlands drained and converted to agricultural uses: 1) The DNR Bureau of Water Regulation and Zoning, Wisconsin Wetlands Inventory: 2) The United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Wetland Inventory; 3) The USDA-NRCS Marquette County Soil Survey. Other aids to identification of wetlands include the USGS topographic quadrangles and USDA Farm Service Agency aerial slide history.

The general soil map for Marquette County shows identifiable soil associations. A soil association is a landscape that has a distinctive proportional pattern of soils. The Houghton-Adrian association makes up 18 percent of the county and both soils are hydric. This association was often artificially drained and used for truck crops and mint. The mint market has fallen, and older farmers are choosing not to maintain drainage systems. This has coincided with increasing public awareness of the value of wetlands and the availability of government programs to restore wetlands. Several large USDA-NRCS Wetlands Reserve Program (WRP) projects have been completed in this soil association (Duffy's Marsh, 1700 Acres, south of Montello on Hwy 22).

There is an opportunity to restore many more acres of wetlands in Marquette County. Interest in the WRP program has generated a large workload. The US-FWS private Lands Program has also been active in restoring wetlands. The DNR Priority Watershed Program has made financial and technical assistance available to landowners to restore and enhance wetlands through LWCD. Interest has been from traditional farmers and from non-traditional landowners. Marquette County

has seen an increase in landowners interested in recreational uses, which includes wetland wildlife habitat restoration.

Private organizations such as Ducks Unlimited, Pheasants Forever and Wisconsin Waterfowl Association have assisted in restoration efforts. Partnership opportunities may provide additional financial incentive to landowners to restore wetlands. These partnership efforts may also provide technical assistance. The biggest challenge to Marquette County LWCD employees may well be keeping up with the wetland restoration workload.

Wildlife Resources

Marquette County has a very diverse landscape that includes large wetland/marsh complexes, rolling hills, open and wooded sandy plains and farmland; all of which is intermixed with lakes, streams, and rivers. This extremely diverse landscape, which is located on the southern fringe of the tension zone of Wisconsin, provides habitat for a wide variety of wildlife associated with the southern and northern reaches of the state.

Bobwhite quail, normally associated with the south, are found in the county. While black bears (although not in significant numbers), normally associated with the northern part of the state, are also found in the county.

The wildlife populations most commonly found in the county include: waterfowl, deer, turkey, upland game species (including cottontail rabbits, fox and gray squirrels, woodcock, ruffed grouse, and bobwhite quail), fur-bearing animals (red and gray fox, coyote, beaver muskrat, otter, mink, raccoon, skunk, opossum), swans, sandhill cranes, herons and egrets, raptors (red-tailed, red-shouldered, Cooper's and Sharp-shinned hawks, eagles, osprey, kestrels), owls (great-horned, barred, screech), several species of songbirds, wetlands birds, reptiles, and amphibians. Several hundred kinds of birds can be found at times in the county, ranging from the small ruby-throated hummingbird to the large white pelican.

The lakes, wetlands, rivers and streams of Marquette County have provided excellent waterfowl and wetland wildlife habitat for centuries. With the relatively recent drainage of those wetland areas much of that original wetland habitat has been lost or seriously degraded and with this loss of habitat many species of wildlife associated with wetland communities, and stream corridors several areas were purchased by the Department of Natural Resources or the U.S. Fish and Wildlife Service. These areas are managed and maintained as State Wildlife Areas, Fishery Areas, and the Fox River Wildlife Refuge. These properties provide areas for all types of hunting, trapping, and wildlife watching opportunities. In addition, several recent federal and state programs have been restoring wetlands on private lands within the county. Several large muck farms have been recently restored to wetlands and are providing additional wetland habitat for local, transient, and migratory wildlife.

The diverse landscape, a mixture of upland oak/pine forest, grassland, wetlands, and agriculture, provides ideal habitat for white-tailed deer and wild turkeys. Both are extremely abundant and are passionately pursued by hunters within the county. Marquette County, despite its relatively small size, ranks in the top 20 of the total number of deer harvested annually. Along with this high deer density, Marquette County has had the highest amount of agricultural deer damage within the state. The majority of Marquette County is in private ownership, greater than 85%, and the majority of deer hunting opportunity occurs on private land. Therefore, private landowners have the largest impact on deer harvest and the deer population in the county. The increased value of hunting land and privatization of hunting opportunity has made it more difficult for hunters to gain access to

private land for deer hunting. In addition, the recent trend in Marquette County has been towards Quality Deer Management (QDM) in which deer are "passed up" by hunters allowing antlered deer to become older and grow larger antlers, thereby making access more difficult for non-landowners. Wild turkeys have been restored to the county and are expanding and providing significant hunting opportunity throughout the county. Once again, the majority of hunting opportunity for turkeys occurs on private land.

The county also has many special resource concerns that require protection and recognition in planning and implementing land and water resource management. Many natural communities exist in the counties that are found on public and private lands. These communities include: northern and southern sedge meadow, tamarack fen, open bog, dry prairies, pine and oak barrens, and cold-water springs, seeps, streams, and several others.
Several rare or endangered species have been known to occur in Marquette County, both terrestrial and aquatic, and have been mentioned elsewhere within the county plan. Due to Marquette County's location in the state of Wisconsin, almost any common species of wildlife found in Wisconsin can be seen at times within the County.

Forestry Resources
Marquette County has about 95,000 acres of forestland. The wooded acers of upland consist primarily of Oak, Pine and Central Hardwoods. In the lowland woods you will find Tamarack, Black Spruce and Bottomland Hardwoods. The majority of the County is made up of poor quality "scrub oak" that has low value as timber. Converting these areas to an oak-pine mixture would increase the quality of stands. Improving these areas would also improve wildlife habitat while increasing the value of the timber.
Forest management in Marquette County is difficult. Insects and diseases will continually take their toll, however, the largest resource concern for the forests of the County is the fragmentation of remaining woodlots. Current plans and ordinances do not properly protect woodlots when it comes to development. Subdivisions and housing developments, large or small, are put in without concern for the resource.

The future of forestry in the County is at a turning point. Landowners in general are making strides in managing their forests. Careful land use planning in the future could help us balance development pressure and the forestry resources of the County.

Land Use Trends
Marquette County in the past has remained greatly undeveloped because land was relatively available and affordable near large urban areas such as Madison and the Fox Cities. As these larger urban areas expand people desire to seek areas of peace and tranquility away from the urban communities. People from the larger urban areas have begun to recognize Marquette County for its rural character, lakeshore properties, natural resource opportunities, and available affordable land for building. Lakeshore and wooded acreage are in high demand. The recent influx of settlers from more populated areas has caused the values of lakeshore and mature wooded property to increase 200-300% from the early 90's.

In 1950, about 50% of the land was farmland, 30% forestland, and 18% wetland, and 2% developed (Wisconsin Conservation Department 1954). In contrast, it is estimated that Marquette County is about 1/3 wetland, 1/3 farmland, and 1/3 woodland in 1999 (Jim Kronschnabel, Wisconsin Department of Natural Resources, County Forester and Kautza 1998). Many lands that were unsuitable for framing such as wetlands, highly erodible, and sandy soils recently were restored to

prior conditions thus the reason for reduced farmland in the past 49 years. The popularity federal conservation funding programs such as the Natural Resource Conservation Service, Wetland Reserve Program has restored thousands of acres of wetlands that were once drained with tile and ditches.

Increased development with the county has caused large parcels of land to become fragmented. Fragmentation of the land has a negative affect on many species of wildlife and can impact the scenic beauty of the county. The new development is often scattered on large parcels of land taking unnecessarily large amounts of acreage out of productive agricultural use and impacts natural resources such as lakes, streams, and woodlands. The amount of Forestland sold and diverted to other uses varies. In 2005 it was 4%, 2006 was 20%, 2007 was 13% and 2008 was 0% (Wisconsin Agricultural Statistics Services, WASS, 2009).

Marquette County is the one of the fastest growing counties in the state with a population increase of 18% from 1990-2000. Our location puts Marquette County residents in close proximity to Oshkosh, Stevens Point and Madison, which are less than an hour drive from the respective corners of the county. This increase in population has put additional pressure on farmland demand. We now have larger parcels of land being purchased and diverted to single family homes and developments at a high rate.

The county has 93 lakes of which 61 are named and 32 are unnamed comprising a total of 5,736 acres. The county has several lakes that were previously undeveloped but with increasing land prices owners of large tracts are selling lakeshore lots that net high prices thus impacting critical lakeshore habitat.

Agriculture Trends

Like many counties in central Wisconsin, Marquette County is going through changes in farming operations and land ownership. Part of the change reflections commodity crop and livestock prices received by farmers, some is due to retiring farmers, and also the demand from urban centers like Madison, Fond du Lac, and Stevens Point. Marquette County is diverse in soil type from sandy loam to heavy peat and muck soils. There is an abundance of lakes, rivers, and streams, as well as many artesian wells in the county that produce clean, pure water for resale and home use.

The average value of agricultural land has stayed steady from 2013 to 2017 at $3,003 weighted average per acre in 2013 and $3,108 weighted average per acre in 2017 (Brannstrom, 2018). The flat price of agricultural land is likely a reflection of decreases in agriculture commodity prices. Recreational uses for hunting and land being purchased by retirees for home building have been another factor affecting land values.

Agriculture is a dynamic and ever-changing enterprise. The last several years have been financially trying for many farmers in Marquette County, and throughout Wisconsin. Some of the drops in commodity crop prices may have been reflected in the county agriculture land rent values over the past five years. The National Agricultural Statistics Service (NASS) collects information each year about land rent prices in each county of the state. The information NASS reports is on non-irrigated cropland. An average price is reported for each county. Marquette County dropped from $102/acre in 2013 to $53 per acre in 2016, a reflection of the poor commodity prices for several years in succession. These values remain below the US average for non-irrigated land at $125 per acre (NASS, 2018).

The number of farms in Marquette County has decreased slightly (by 4%) to 458 farms in 2017. The land in farms also decreased from 120,185 acres in 2012 to 113,183 acres in 2017. Overall farm numbers decreased slightly along with the actual size of farms down to 247 acres per farm.

Farms in Marquette County

- 458 in 2017, down 4% from 2012 (Census of Agriculture, 2017)
- 113,183 acres in farm (Census of Agriculture, 2017)
- Average farm size is 247 acres (Census of Agriculture, 2017)
- 72% of farms are less than 180 acres (Census of Agriculture, 2017)
- 72% of farm acres are put to crop production (*See table 2-1 for Cropland Acres Map*)
- Link to the 2017 Census of Agriculture- Marquette County Information: https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Wisconsin/cp55077.pdf

Of the total number of operators of farms in the county (729 total operators, farms can have up to four primary operators), 297 list farming as the principal occupation and 432 list other occupations as the primary source of income. Total farm income in Marquette County was $71,475,000 in 2017, compared to $69,680,000 in 2012. Crop sales represent 51% of the total value of farm income in 2017. Livestock sales accounted for 49% of the total value in 2017. The number of livestock operations has remained fairly steady the past five years. Beef cow-calf operations have decreased slightly to 80 herds in the 2017 Census of Agriculture with 1,118 cows that produce calves annually. Farms engaged in dairy stayed steady at 47 farms in the 2017 Census. However, Marquette dairy farmers have increased dairy cow numbers slightly from 5,999 in 2012 to 6,488 cows in 2017.

Hog producers in the county continue to exit due to low prices, the lack of vertical integration opportunities, and no major pork processing facilities in the state. The 2017 Census list 32 farms with swine compared to 25 herds in 2012. Most of increase is due to fair projects and small operations raising a 10-25 pigs annually.

Marquette County has 120 farms with horses, with 792 horses being raised in The County. Since this horse number is from operations with actual sales, this is likely an underrepresentation of total horse numbers in county.

Highlights from the 2017 Census of Agriculture about Marquette County:

- Land in farms decreased by 6%.
- Average size of farms decreased 2% to 247 acres per farm.
- Market value of agriculture products increased 3% ($71,475,000 total in 2017) from 2012, with livestock sales accounting for 49% of market value.
- 39% of farms in county used no-till or reduced tillage, 22% used intensive tillage and 16% planted cover crops.
- Since 2012, cover crops on cropland acres have increased by appx 6,000 acres, intensive tillage has decreased by appx 2,800 acres and acres with no-till or reduced tillage has not changed from appx 29,000 acres.

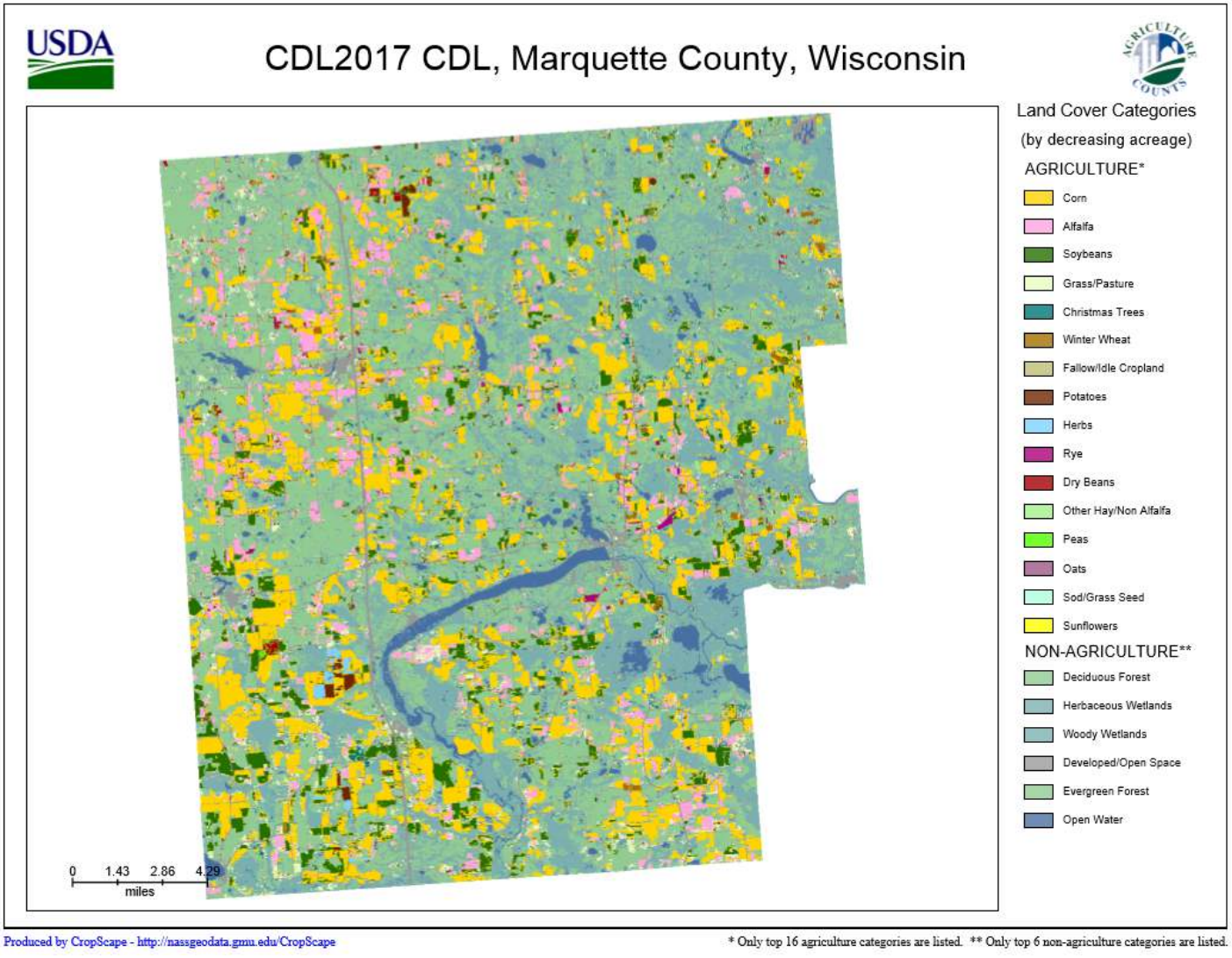
Most of the farm number and size changes described above is the result of more movement of families from urban areas to Marquette

County with the anticipation of making it their permanent home upon retirement. These new residents are buying acreage that range in size from 1-40 acres. Much of the smaller acreage is for residences on the lakes and rivers in the county. Larger parcels are for small livestock operations, which normally consist of beef cattle production with some engaged in other enterprises, including fresh market vegetable production.

Marquette County is also known for its excellent hunting opportunities. As a result, some land that was once farmed is now being purchased and left fallow for wildlife habitat for hunting purposes. This can create challenges with invasive weed populations that may be left unchecked and we are seeing more acres of spotted knapweed and leafy spurge. Roadside vegetation management has also had challenges with the encroachment of wild parsnip in several areas of the county. Identification and targeted removal within private properties and road ditches are critical steps for reduction of these weed populations.

Due to its location, wildlife, and water resources for recreation, Marquette County will continue to see an influx of new residents. We anticipate that a large part of our future workload of providing technical assistance will involve many of these "new" residents.

Table 2-1 2017 Cropping Land Cover Map



Chapter Three

County Surface & Groundwater Resource Assessment

Outstanding and Exceptional Resource Surface Waters

Outstanding Resource Waters include waters with unique characteristics and largely unaffected by cultural activities. They do not presently receive wastewater discharges, nor will point source discharge be allowed to these waters, in the future, unless discharge is so controlled it is of the same or better quality than the receiving water. This classification includes national and state wild and scenic rivers and the highest quality Class I trout streams.

Exceptional Resources Waters have excellent quality and valued fisheries, but already receive wastewater discharges or may receive future discharges necessary to correct environmental or public health problems. This classification includes all Class I trout streams which are not outstanding resource waters or, other water bodies with resource values and high water quality.

Marquette County has seven waters classified as outstanding and exceptional:

Chaffee Creek (class 1 portion)	Outstanding
Lawrence Creek	Outstanding
Tagatz Creek	Outstanding
Caves Creek	Exceptional
Mecan River (to Hwy. 22)	Exceptional
Neenah Creek (to Oxford Pond)	Exceptional
Little Pine Creek	Exceptional

Impaired Surface Water Resources

Section 303(d) of the Clean Water Act requires the Wisconsin Dept of Natural Resources (WDNR) to prepare a list of impaired water bodies *(see tables 3-1 & 3-2)*. The WDNR completes assessments of waterways to identify the pollutants causing the problem, identify the sources of that pollution and then develops a Total Maximum Daily Load (TMDL) of that pollution that a water body can receive and still meet water quality standards. TMDL Planning is currently underway for the entire Upper Fox Basin and is in the public comment stage. See more on TMDL development and implementation in Chapter 4.

Table 3-1 Impaired Waters List 303(d)

Waterbody	WBIC	Stream Segment (Miles)		Water Type	Pollutant	Impairment
		Start	End			
Wedde Creek	156000	0	5.14	River	Unknown Pollutant	Elevated Water Temperature
Grand River	159300	21	43	River	Total Phosphorus	Impairment Unknown
Fox River	117900	145.65	162.1	River	PCBs	Contaminated Fish Tissue
Buffalo Lake	168000			Lake	PCBs, Mercury	Contaminated Fish Tissue

County Watershed Description/Assessment

Minus a very small percentage of the northwest corner, Marquette County primarily lies in the Upper Fox Drainage Basin. The Upper Fox Basin is made up of numerous sub basins *(see table 3-3)* with all ultimately draining to the Fox River System.

Non-point source pollution of lakes, rivers and streams in the watershed continues to be a concern. Excessive weed/algae growth and sedimentation of rivers, streams and lakes have caused a general degradation of the water quality of Marquette County. As a result of this pollution, agricultural, Lake/Stream bank erosion & development run-off are listed as our top County resource concerns.

TMDL Classification

The Clean Water Act requires states to develop a watershed restoration action plan called a Total Maximum Daily Load (TMDL) for each impaired water body on the 303(d) list. A TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. A TMDL is established by defining water quality goals for pollutants causing water quality impairment, determining current pollutant loads and their sources, and using modeling to calculate the pollutant load reduction needed from each pollutant source. The plan assigns responsibilities to each source for needed actions to attain pollutant load reduction goals.

The Upper Fox/Wolf River is a TMDL project watershed *(See table 3-4)* that has been in the development stage for a number of years. Currently, the TMDL (draft) Plan is out for public comment and is scheduled to be approved in spring of 2020 when it will begin implementation. See more on TMDL development and implementation in Chapter 4.

Groundwater Resource Concerns

Marquette County has groundwater concerns from 2 fronts, quantity & quality (described below)

Quantity: County lake levels fluctuate as groundwater tables increase or decrease. Different studies point to different causes with precipitation amounts and high capacity wells being the common denominator. Marquette County is involved with trend studies for lake level and stream baseflow monitoring to gather data for modeling. See annual workplan for details.

Quality: With majority of County having sandy soils and depth to groundwater shallow there are increased chances for groundwater contamination *(See Table 3-5)*. The main concern is with Nitrates being high in public/private drinking water wells. With more wells becoming high in Nitrates, the Marquette County Land & Water Conservation and Health Departments are in the early stages of a collaboration with 6 other Golden Sands Counties in developing a baseline groundwater well testing program focusing on nitrate contamination. Refer to annual Workplan for updates to this project.

Table 3-2 Impaired Waters Map

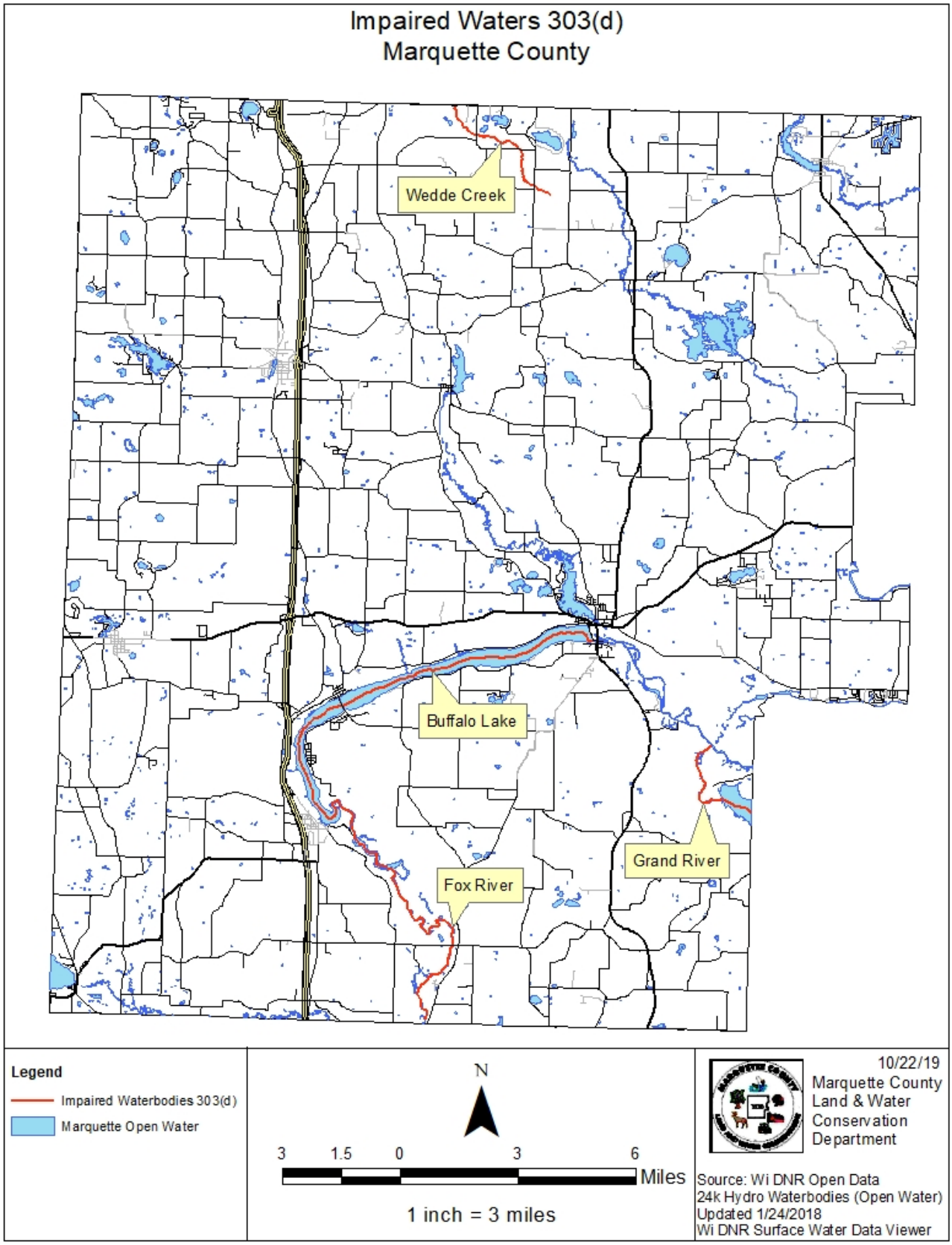


Table 3-3 County Watershed Map

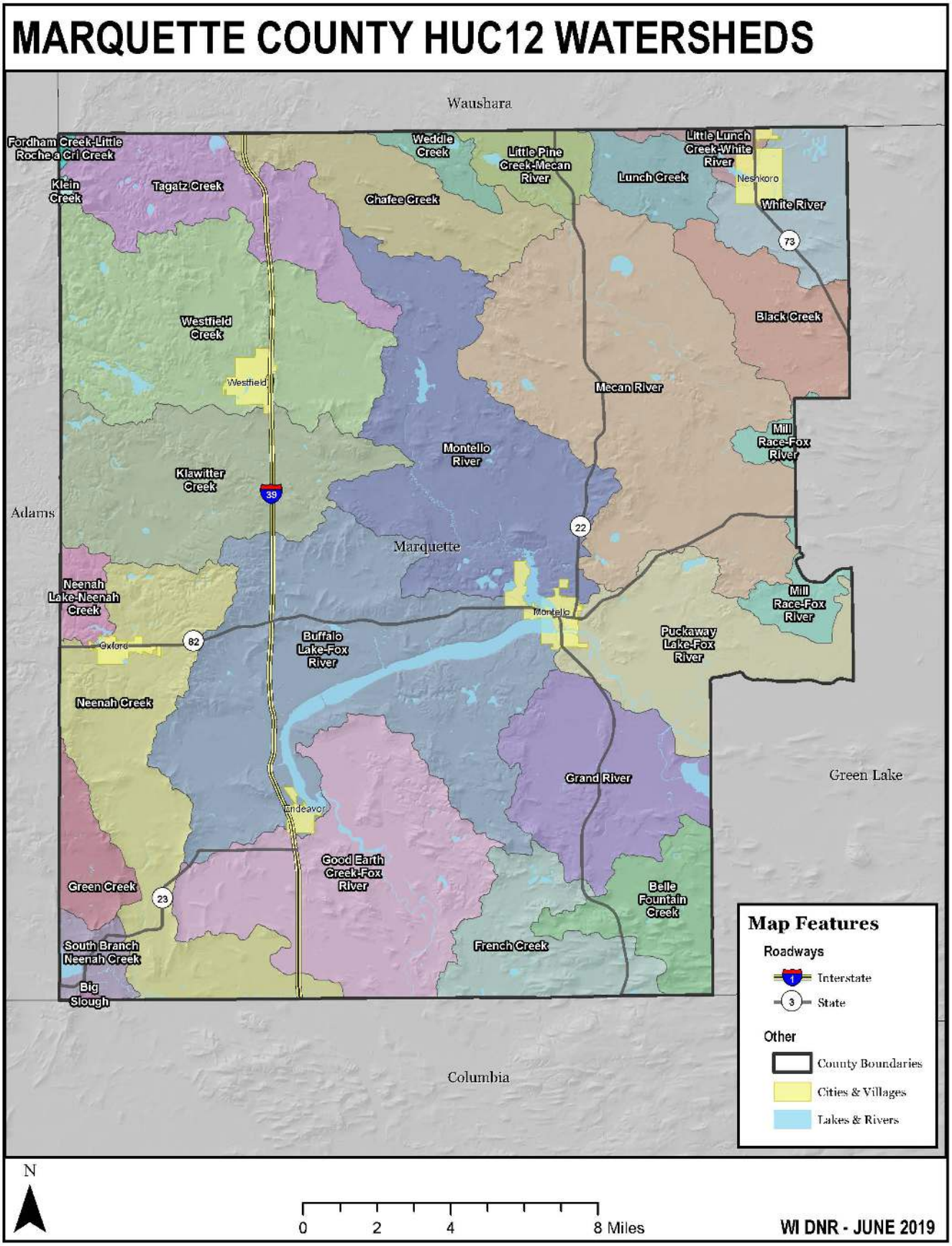


Table 3-4 TMDL Map

Upper Fox/Wolf River TMDL Project Basin Map

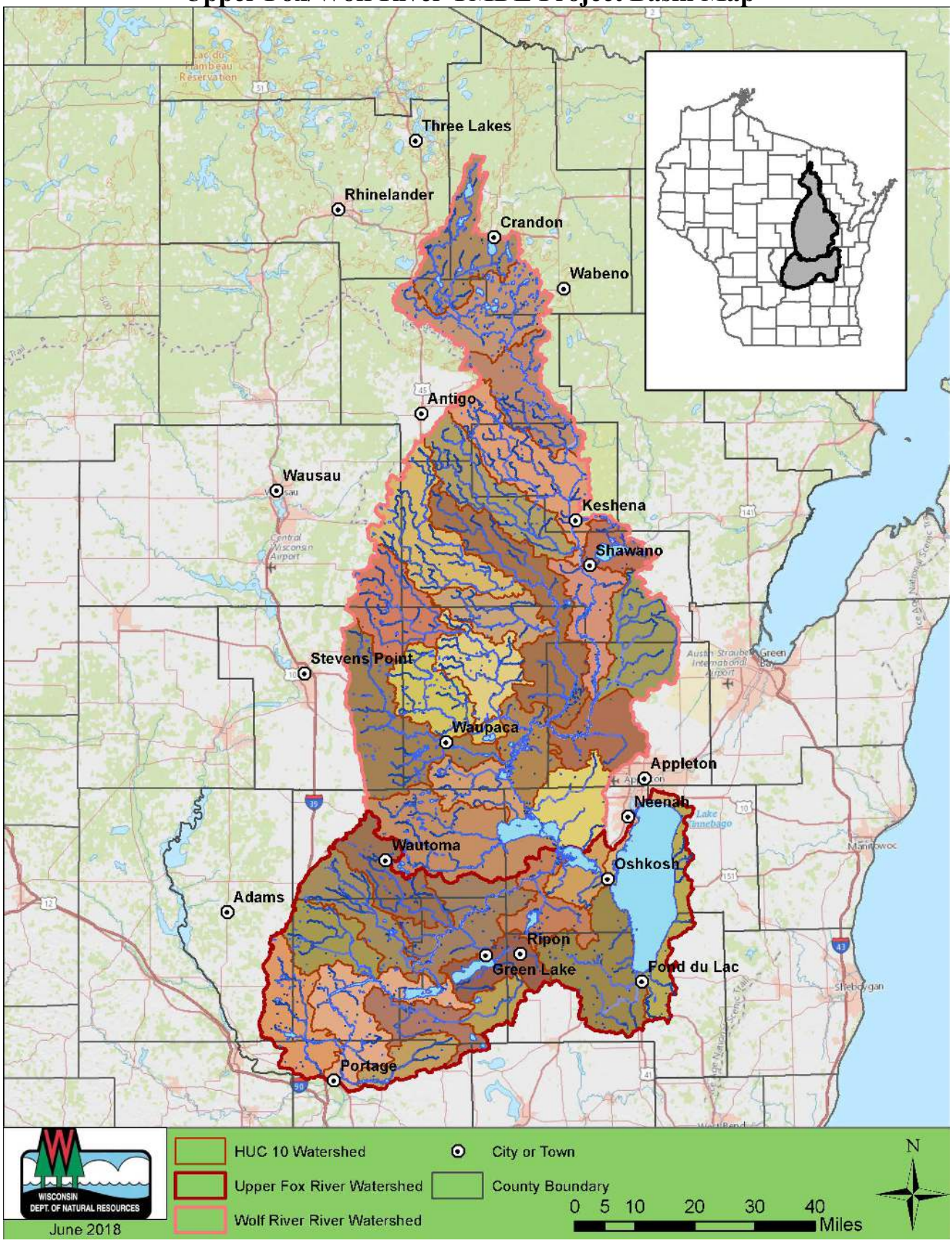
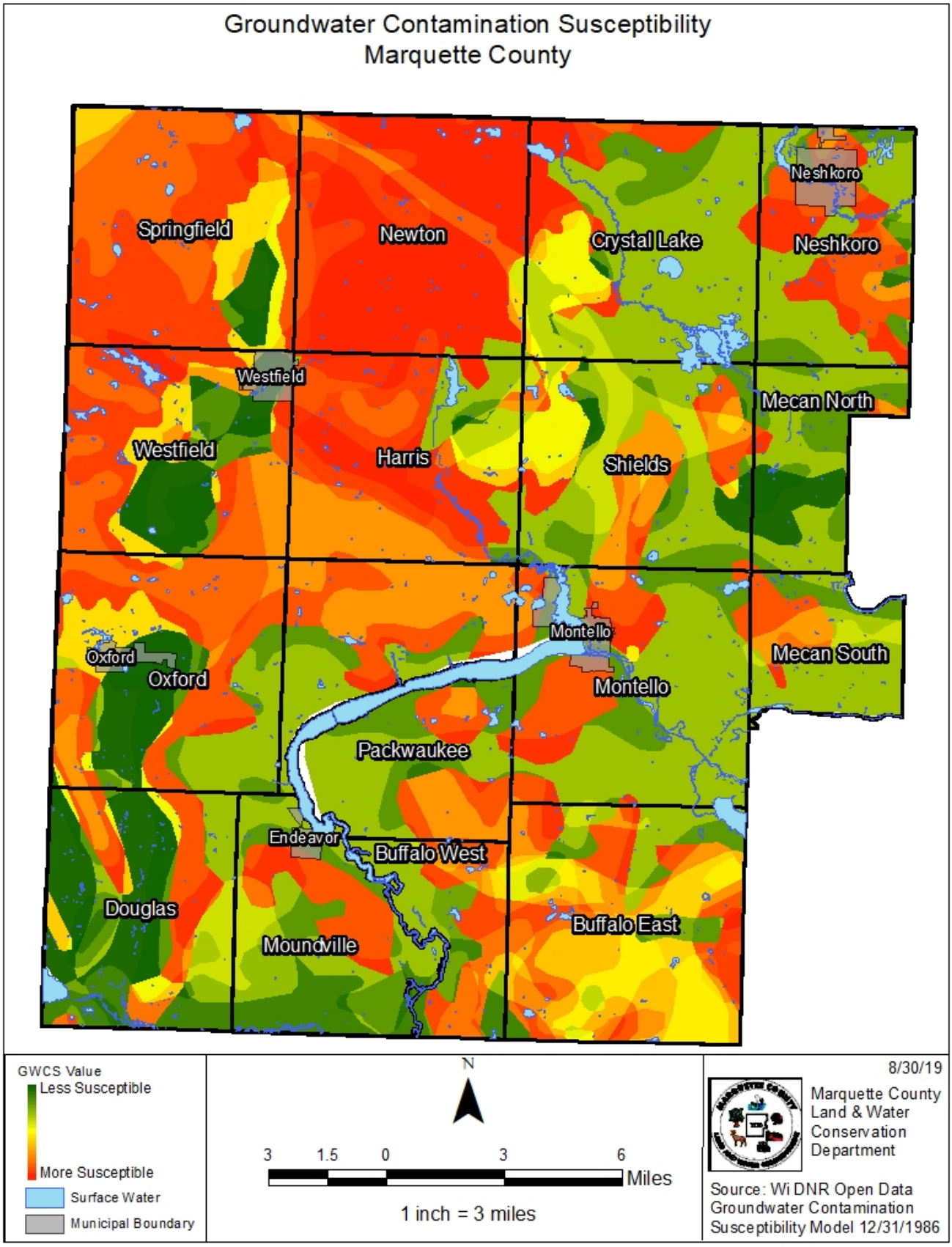


Table 3-5 Groundwater Susceptibility Map



Chapter Four

Estimated Rural Non-Point Source Pollution Loading

Marquette County has threats of non-point source pollution from many sources. Main concerns as described earlier in the plan are from agricultural practices, development and shoreline erosion. In this chapter we will breakdown pollutant loads from agricultural erosion and non-agricultural erosion.

Agricultural Pollution:

Total Maximum Daily Load Development (TMDL) has provided a better estimate of these numbers through extensive modeling throughout the entire basin. To define the TMDL for a water body, modeling is used to determine the current pollutant loads, their sources, and the amount of reduction needed from each source to reach the water quality goal.

A TMDL considers both waste load allocation (WLA, point sources) and load allocation (LA, nonpoint sources). The WLAs determined in the TMDL for point sources, such as wastewater treatment plants or factories, are addressed through Wisconsin Pollutant Discharge Elimination System (WPDES) permits. Nonpoint source LAs, on the other hand, are more complex and require collaboration by many partners and stakeholders to effectively use available multi-agency programs, education, regulations, and financial and technical resources.

Using TMDL Modeling, we now have accurate pollutant load numbers to use as a base for planning. Phosphorus and Total Suspended Solids Loading baseline totals to meet TMDL Standards are now known *(see tables 4-1 & 4-2).* Please note these pollutant tables are from ALL sources: WLA & LA (point and non-point source).

For further breakdown of Land Use and baseline Phosphorus and Total Suspended Solids Loadings per HUC12 Watershed basin, see appendices #2 through #24. Tables 5-2 and 5-3 of this plan show target loads (edge of field using SNAP Plus) for Agricultural (Phosphorus) Reduction. Marquette County will use tables 5-2 and 5-3 as Water Quality objectives for agricultural fields during the plan's ten-year schedule.

To find more information on the Upper Fox TMDL development and access to other information, please visit: https://dnr.wi.gov/topic/TMDLs/FoxWolf/

Non-Agricultural Pollution:

Construction Site and Stormwater Run-Off

Little data, specific to Marquette County, exists for assessing sediment delivery from construction sites. However, DNR estimates an average construction site can erode 30 tons/acre of sediment to waterways, if not controlled with erosion control practices. Due to the high delivery rates, construction sites are a large source of the sediment polluting Wisconsin waterways.

Streambank/Lakeshore Erosion

Insufficient data makes gauging erosion rates from this erosion difficult. However, using the Neenah Creek Watershed Inventory of erosion and extrapolating this to a County Wide number would show Marquette County loses approximately 2,600 tons of sediment each year to stream and lake shore erosion

Table 4-1 All Sources Phosphorus Baseline Loadings

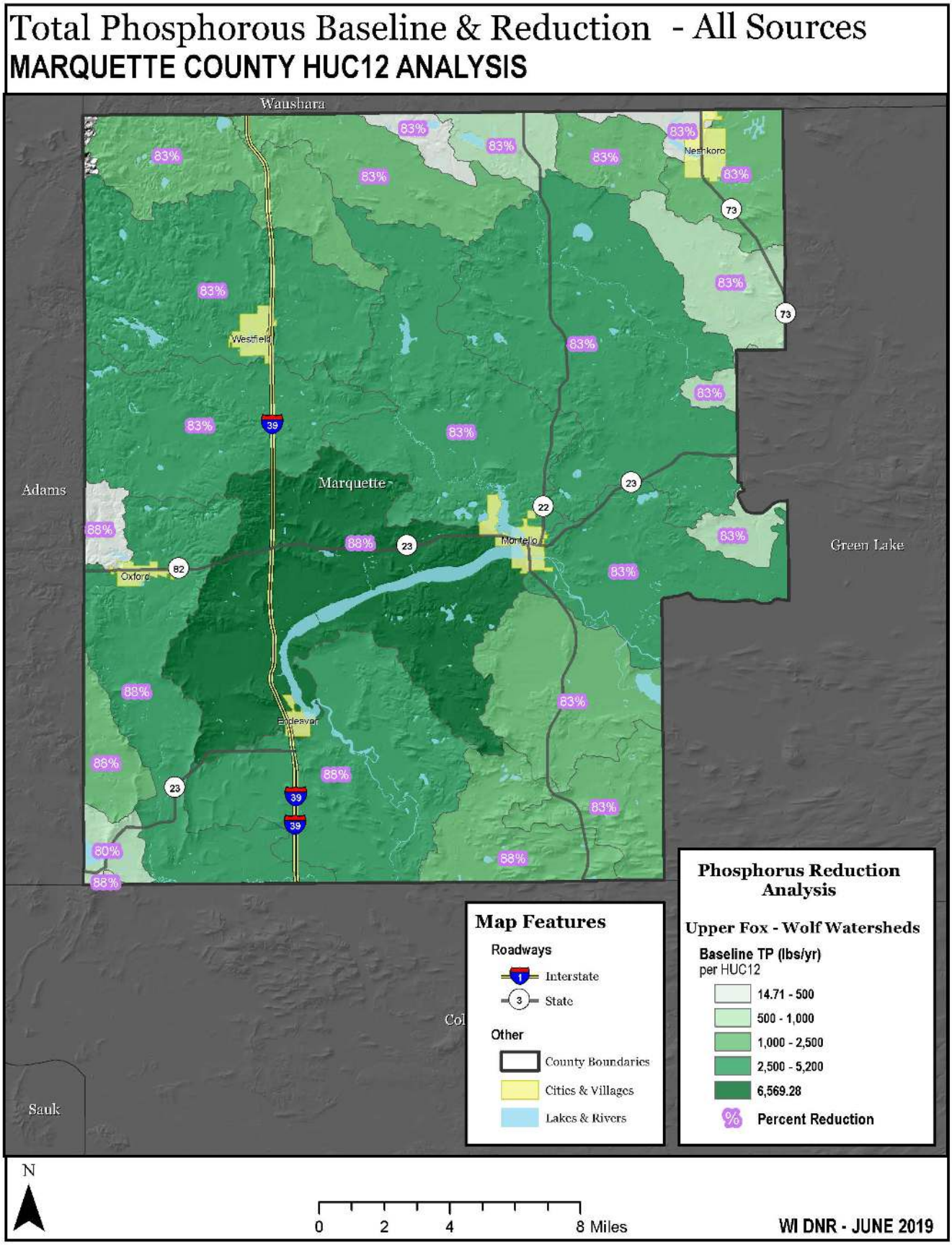
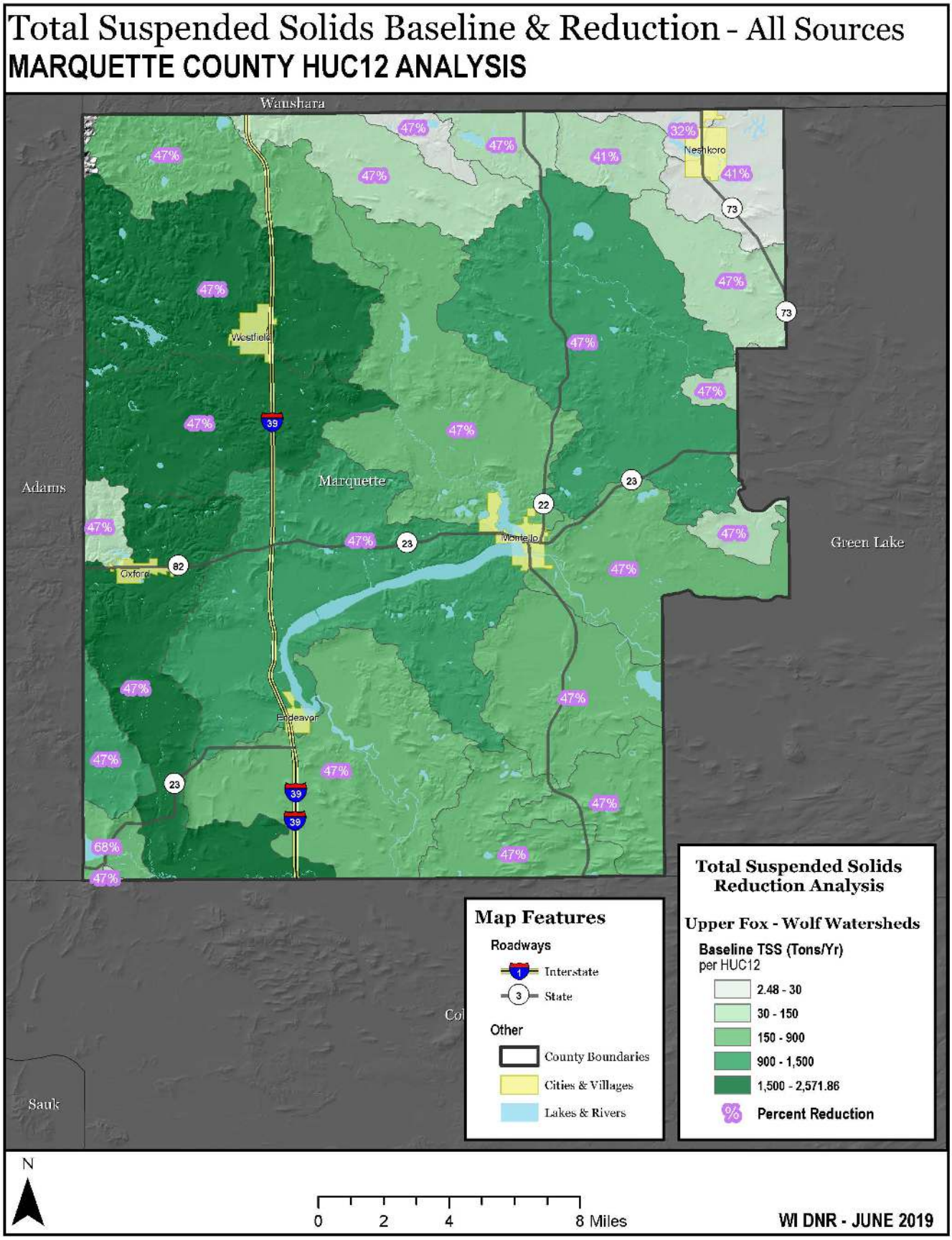


Table 4-2 All Sources Total Suspended Solids Baseline Loadings



Chapter Five

Goals, Objectives and Actions

Numerous methods have been used to determine County Resource Concerns and in turn, set goals/objectives to develop an action plan to address these concerns. Some of the methods used in this process include:

1. Citizen Advisory Committee
2. TMDL Development Process
3. Prior Marquette County LWRM Plans
4. Staff and inter-agency collaboration

Non-Point Source Pollution and how it relates to Sediment and Nutrient Delivery is the overall concern to Surface and Ground Waters in Marquette County. These non-point sources vary, but agricultural run-off and near shore erosion and disturbance are top priorities. Historically and in the future the main goal of the LWCD would be to reduce these sources of non-point source pollution.

Using the following 4 action tools, Marquette County will address the above concerns as resources (staffing, cost share, etc.) exist. ***Each tool is described in detail below***.

1. Farmland Preservation Program
2. NR151 Agricultural Performance Standards
3. TMDL Implementation
4. Voluntary Compliance

After determination of what action tool to use, Marquette County will prescribe Best Management Practices & offer available cost share assistance to correct resource concern and bring property into compliance with state run-off Standards. For list of Best Management Practices, *see appendix A*.

Farmland Preservation Program

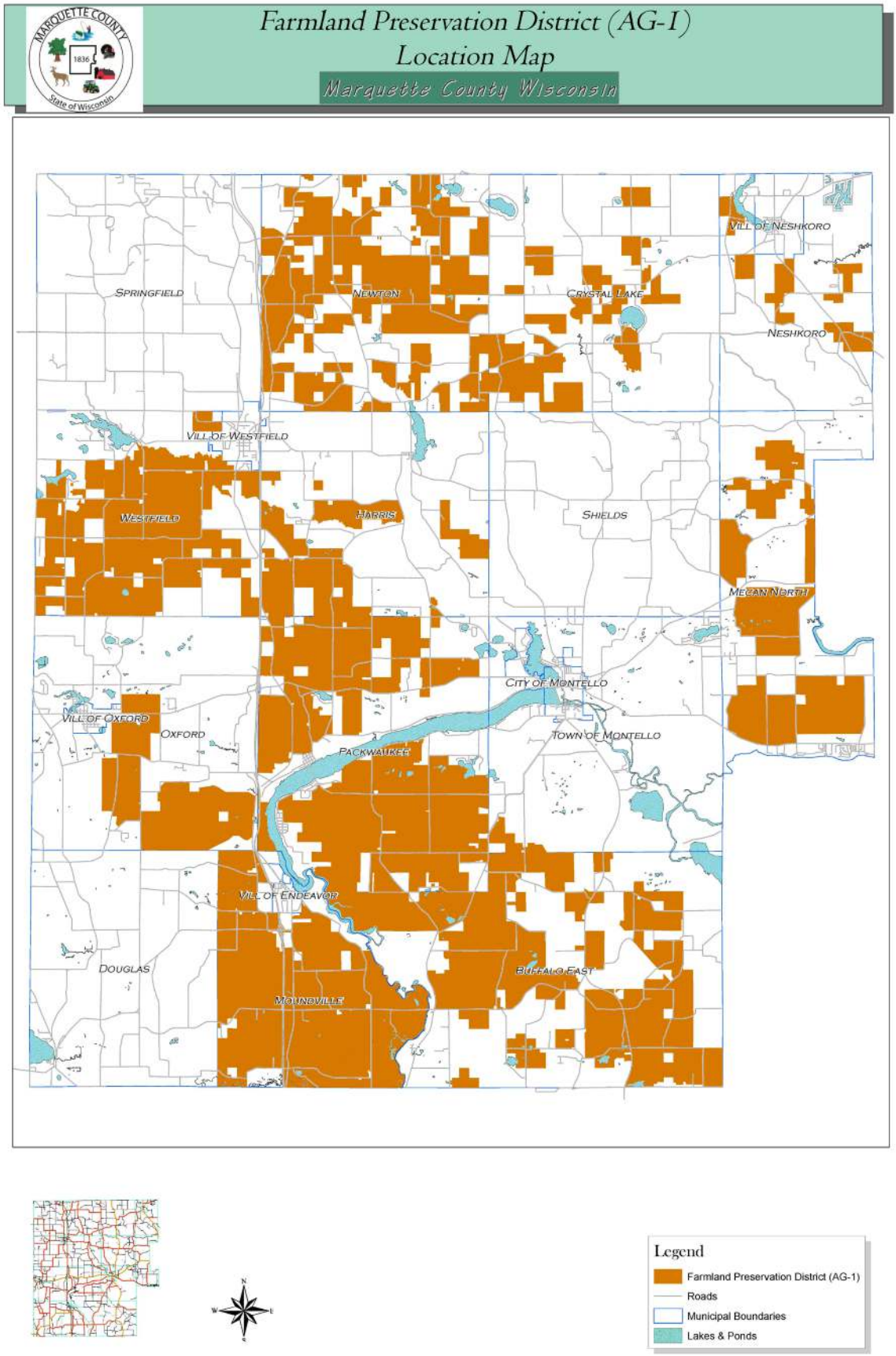
The Wisconsin Farmland Preservation Program (FPP) has seen rapid growth in Marquette County. Participation/enrolment in FPP increased from 32 Participants in 2013 to 68 in 2019. Marquette County has 89,345 acres *(see table 5-1)* in Farmland Preservation District (Ag. 1 Zoning) with 21,635 acres (68 participants) enrolled in the program. Currently, Marquette County tracks FPP Participation and NR151 compliance using a spreadsheet/database with future plans to migrate to a GIS Based system as it becomes available. Current trends show participation to be evenly distributed throughout FPP Eligible areas in the County *(see table 5-1).*

All farms need to meet the State Agriculture Performance Standards/NR151 to be eligible for the FPP credit. Marquette County intends to use FPP Program eligibility criteria as the main tool for NR151 implementation throughout County. Currently, all 68 participants were found to meet NR 151 performance standards & have been issued a Farmland Preservation Certificate of Compliance to maintain tax credit eligibility. FPP certificates of compliance are not the same as a NR 151 compliance determination, issued according to NR 151.09 or 151.095. Marquette County will work with WDNR staff on NR 151 compliance determinations, as staff & financial resources allow. Annual workshops are held to target Landowners whose land is eligible for the FPP Credit. Not only does this help County Landowners, it enables Marquette County to further NR151 implementation in the County.

Upon applying for the FPP Credit, County Staff will:

1. Perform Farm Inventory & determine eligibility
2. If found not compliant with State Run-Off Standards, a Schedule will be set to bring into compliance.
3. Perform Status review every fourth year to check compliance

Table 5-1 Areas with Farmland Preservation Planning



NR151 Agricultural Performance Standards
Wisconsin's rules to control polluted runoff from farms, as well as other sources, went into effect October 1, 2002. The State legislature passed the rules to help protect Wisconsin's lakes, streams and groundwater. WDNR Administrative Rule NR 151 sets performance standards and prohibitions for farms. DATCP Administrative Rule ATCP 50 identifies conservation practices that farmers must follow to meet performance standards in NR 151.

Marquette County will take the lead role in implementation of NR151 Ag. Performance Standards as resources permit, using the 4 action tools listed on page 24.

NR 151 Standards and Prohibitions

All Farmers Must:
 Must meet tolerable soil loss ("T") on all cropped fields & pastures. (NR 151.02)
 Follow a nutrient management plan meeting NRCS 590 standards, designed to limit entry of nutrients into state waters (groundwater and surface water). (NR 151.07)
 Phosphorus Index: Croplands, pastures, and winter grazing areas shall average a phosphorus index of 6 or less over the accounting period and may not exceed a phosphorus index of 12 in any individual year within the accounting period.
Avoid tilling within 5 feet of the edge of the bank of surface waters. This setback may be extended up to 20 feet to ensure bank integrity.

Farmers who raise, feed or house livestock
 Prevent direct runoff from feedlots or stored manure into state waters.
 Limit livestock access to state waters to avoid high concentrations of animals and maintain adequate or self-sustaining sod cover along waterways.
Prevent Significant discharges of process waste water into surface or groundwater.

Farmers who have or plan to build, a manure storage structure:
 Maintain structures to prevent overflow. (NR 151.08)
 Repair or upgrade any failing or leaking structures that pose an imminent health threat or that violate groundwater standards. (NR 151.08)
 Close idle manure storage structures according to NRCS standards. (NR 151.08)
 Meet technical standards for newly constructed or substantially altered structures. (NR 151.05)

Farmers with land in a Water Quality Management Area:
(300 feet from a stream, 1000 feet from a lake, or in areas susceptible to groundwater contamination)
 Avoid stacking manure in unconfined piles. (NR151.08)
 Divert clean water away from feedlots, manure storage areas and barnyards located within this area. (NR151.06)

Identification of Priority Farms
Farms that would be considered a "priority farm" are those that are found to be non-compliant with state prohibitions/performance standards listed above. Priority Farm status is ranked in this order:

1. All Farms participating in the State Farmland Preservation Program (FPP)*****
2. Farms located in areas of concern identified in the Upper Fox TMDL
3. All complaints found to be in violation of the Standards & Prohibitions*****
4. Any farm voluntarily asking for compliance determination

***** *Further Priority is given to farms located in a Water Quality Management Area (WQMA)*

Information and Education
Marquette County will continue its current information and education strategy (for complete I&E Strategy see Chapter 6). Partnering agencies UWEX, USDA NRCS, WDNR are often depended upon to help with I&E. Conservation Field Days, trainings, newsletters and school visits will be the main target for the Land & Water Conservation Department to encourage voluntary compliance with the Standards and Prohibitions.

Current Compliance Status
Current Geographical Information System (GIS) Capabilities are lacking to effectively determine current compliance with NR151 in Marquette County on a spatial/geographic basis.
WDNR is currently developing tracking software titled BITS or *"**Best Management Practice Implementation Tracking System"***. Marquette County plans on utilizing this software to determine current AND future NR 151 compliance.

BITS Tracking Software Mission:

DNR nonpoint source (NPS) pollution control programs require external entities (counties, permittees, consultants, and others) to submit data regarding how they are using State and other funds to reduce NPS pollution. Given the number of different programs that need and use this type of data (including: nonpoint source grants, such as the Targeted Runoff Management (TRM) grant program, NR 151 compliance tracking, multi-discharger phosphorus variance, total maximum daily load (TMDL) implementation, Wisconsin's adaptive management option, and water quality trading), it is advantageous to develop a system that efficiently facilitates data submission (including the spatial component) and analysis so DNR can provide better transparency to the public as to how funds are being used and so DNR can better track and show progress towards reaching the Wisconsin's nutrient reduction goals related to TMDLs, Statewide Nutrient Reduction Strategy, and other DNR and EPA reporting requirements.

Once available, Marquette County will be able to update the BITS Database and determine how many farms are NR151 compliant on a parcel by parcel basis. This will help determine the status of NR151 Compliance in Marquette County.

On Site Evaluations
Onsite visits will be performed throughout the implementation of the LWRM Plan as staff hours permit and will be prioritized in the following order:

1. Farmland Preservation Program Participants.
2. Review at the request of a landowner.
3. Complaints received, investigated and reasonable doubt is found to warrant an onsite visit.

County staff will determine compliance. If a farm is determined non-compliant, a letter will be drafted documenting the following:

1. Field(s) or farmstead and location
2. Performance Standard not met
3. Best management practice to be installed
4. Estimated costs
5. Status of cost share assistance

Staff will follow up with landowner with a meeting to discuss a compliance timeline.

Upon completion of suggested practice(s), a letter of NR151 compliance determination will be sent to the landowner indicating the site has been brought into compliance and the BITS database will be updated.
Marquette County will consult with WDNR on a case by case basis when a NR151 compliance schedule or date to become compliant cannot be met or agreed upon by Landowner.

Enforcement
If landowner(s) refuses to work voluntarily along with Marquette County to resolve non-compliance with the NR 151 performance standards, all related information (status reviews, letters of notification, reports) will be forwarded to the WDNR. County can and will still provide technical support at this time, if Landowner agrees to become compliant.

Total Maximum Daily Load (TMDL)

Marquette County is entirely in the Upper Fox Basin which is a TMDL (see chapter 4 for TMDL Development). Implementation phase of the TMDL is expected to start in spring of 2020.

As TMDL implementation starts, Marquette County will assist with implementation efforts as opportunities and resources allow. If resources do so exist, Marquette County will focus on reducing phosphorus and Total Suspended Solids following TMDL Implementation plan.

Tables 5-2 and 5-3 show target loads (edge of field using SNAP Plus) for Agricultural (Phosphorus) Reduction. Marquette County will use tables 5-2 and 5-3 as water quality objectives for agricultural fields during this plan's ten-year schedule. Marquette County recognizes some agricultural fields may not be able to achieve the agricultural field TMDL reduction targets.

Voluntary Compliance

Marquette County has always used voluntary compliance as a tool when trying to bring Lands into compliance with NR 151 performance standards. Using a strong Information & Education Strategy (see Chapter 6) in the past has proven to be effective and we will continue this strategy in the future.

Voluntary measures to get Landowners compliant with NR151 include (but not limited to):

1. Awareness of current State Standards and Prohibitions
2. Options available to get them into compliance
3. Cost Sharing and Technical Assistance available to them

Table 5-2 Phosphorus Reduction Goals

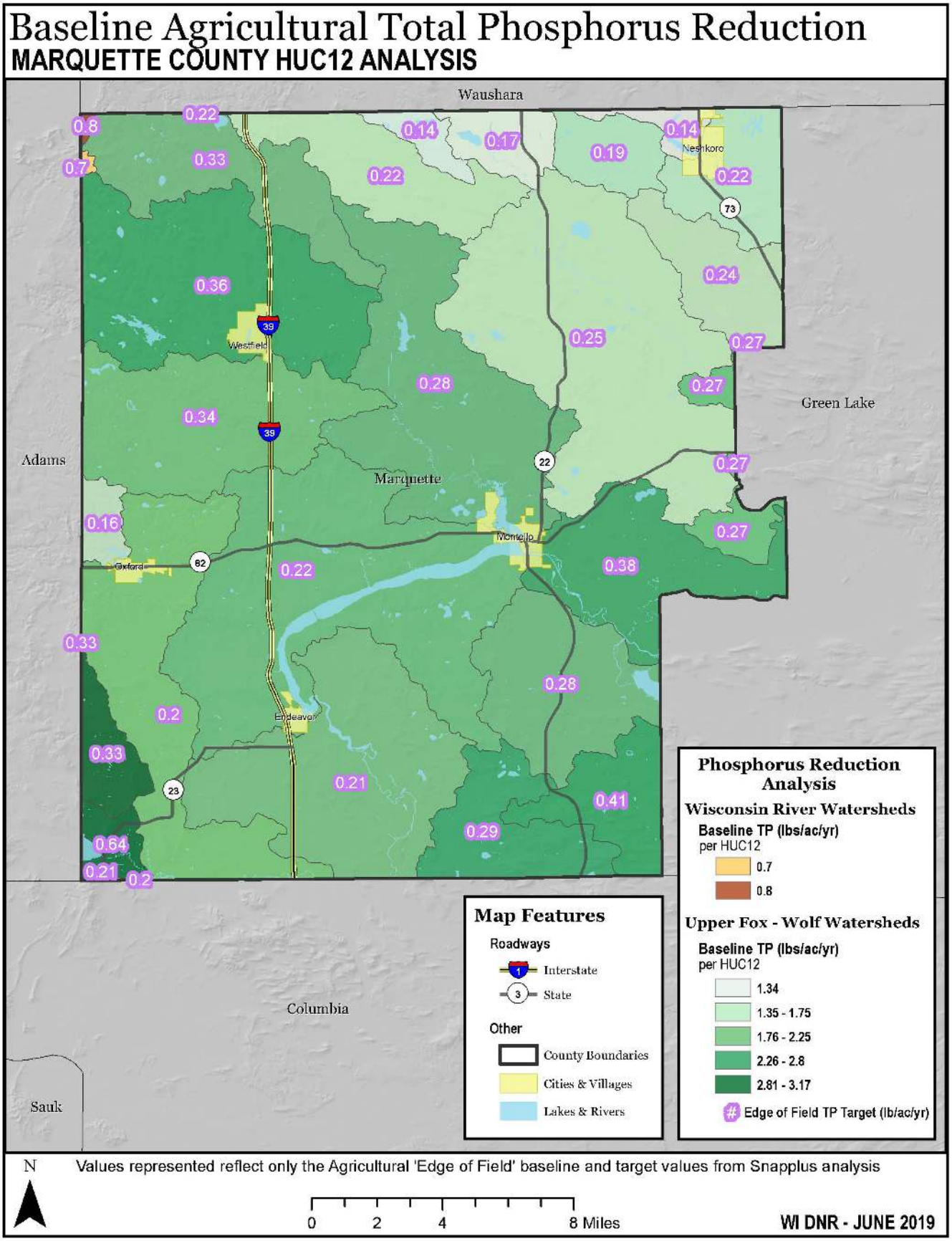


Table 5-3 Phosphorus Reduction Goals

Marquette County - Edge of Field Total Phosphorus Target by HUC12						
HUC12 CODE	HUC12 NAME	TMDL	CROPLAND ACRES IN CTY.	BASELINE TP(lb/ac/yr)	TARGET TP CC(lb/ac/yr)	TARGET TP SSC(lb/ac/yr)
070700030901	Fordham Creek-Little Roche a Cri Creek	WRB	3.01	0.8	0.8	0.3
070700031802	Klein Creek	WRB	0.00	0.7	0.7	0.3
040302010201	Neenah Lake-Neenah Creek	UFW	561.34	1.34	0.16	
040302010202	Green Creek	UFW	2,396.93	2.8	0.33	
040302010203	South Branch Neenah Creek	UFW	641.36	3.17	0.64	
040302010204	Big Slough	UFW	15.32	1.77	0.21	
040302010205	Neenah Creek	UFW	9,423.50	1.74	0.2	
040302010301	Tagatz Creek	UFW	3,178.47	1.95	0.33	
040302010302	Westfield Creek	UFW	8,005.20	2.14	0.36	
040302010303	Klawitter Creek	UFW	8,396.85	2	0.34	
040302010304	Montello River	UFW	6,705.08	1.63	0.28	
040302010503	Belle Fountain Creek	UFW	2,969.34	2.37	0.41	
040302010504	Grand River	UFW	4,158.61	1.66	0.28	
040302010602	French Creek	UFW	43.19	2.45	0.29	
040302010603	Good Earth Creek-Fox River	UFW	9,575.94	1.82	0.21	
040302010604	Buffalo Lake-Fox River	UFW	12,219.38	1.9	0.22	
040302010605	Puckaway Lake-Fox River	UFW	4,620.72	2.22	0.38	
040302010701	Weddle Creek	UFW	500.76	0.8	0.14	
040302010702	Chafee Creek	UFW	2,727.59	1.27	0.22	
040302010703	Little Pine Creek-Mecan River	UFW	367.15	1	0.17	
040302010704	Mecan River	UFW	10,115.98	1.48	0.25	
040302010803	Lunch Creek	UFW	946.99	1.11	0.19	
040302010804	Little Lunch Creek-White River	UFW	453.56	0.84	0.14	
040302010806	White River	UFW	1,575.21	1.27	0.22	
040302011101	Black Creek	UFW	1,121.44	1.41	0.24	
040302011102	Mill Race-Fox River	UFW	1,272.40	1.58	0.27	

Chapter 6

Plan Monitoring/Evaluation and Information & Education

Non-point source programs are always scrutinized for being unable to track the progress of non-point source pollution abatement. In order for this Land and Water Resource Management Plan to be successful, it will be important to regularly measure and track the progress made. This will also help to make necessary adjustments and revisions to this "working plan" as they are needed.

The LCC will review (and submit to DATCP) our annual workplan and adjustments will be made to insure the LWRM Plan is being implemented to its fullest extent.

Monitoring & Evaluation Strategy

As stated in Chapter 5, Marquette County is currently lacking GIS/Database features to track current compliance effectively. WDNR is currently developing tracking software titled BITS or *"**Best Management Practice Implementation Tracking System"***. Marquette County plans on utilizing this software and to determine current AND future compliance.

Annual DATCP Reporting and Farmland Preservation Program Status Reviews (every 4th year) will also be used to track progress of this LWRM Plan and used as an evaluation tool.

Information & Education Strategy

Marquette County has always used an aggressive Information & Education (I&E) Program to inform Landowners/Producers of the possible ordinances, available programs and other issues that may benefit them. In the table below, we have broken down the different focus areas of I&E Outreach and what audience we are targeting.

Whenever possible, Marquette County partners with other agencies (UW Extension, NRCS, etc.) to take advantage of their expertise and outreach capabilities.

PROGRAM/TOPIC	***TARGET AUDIENCE***	***ACTION(s)***
Farmland Preservation Program	Eligible Landowners	Annual workshop targeting eligible L.O. Mailers, social media,
NR151/Standards & Prohibitions	All County Producers	All workshops, Direct mailers, social media, relation to other programs (FPP)
Nutrient Management (SNAPPlus)	All County Producers	Annual Farmer training (new and continuing) Mailers, social media, relation to other programs
Contractor/Excavator Awareness	Participating Contractors	Bi-annual workshops, on-site discussions, relation to County ordinances
Youth Education	County Schools/Youth	Annual Speaking/Poster contests Conservation Days/Camp In-Class presentations
Community Outreach	All County Residents	Press Releases, Website, Social Media
Conservation Tree Sale	All County Residents	Provide access and availability to quality trees for conservation needs.
County Wide Lakes Groups	All County Lake Residents	Provide conservation information and assistance.

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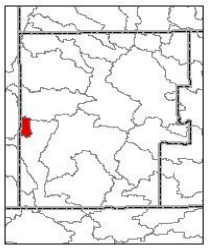
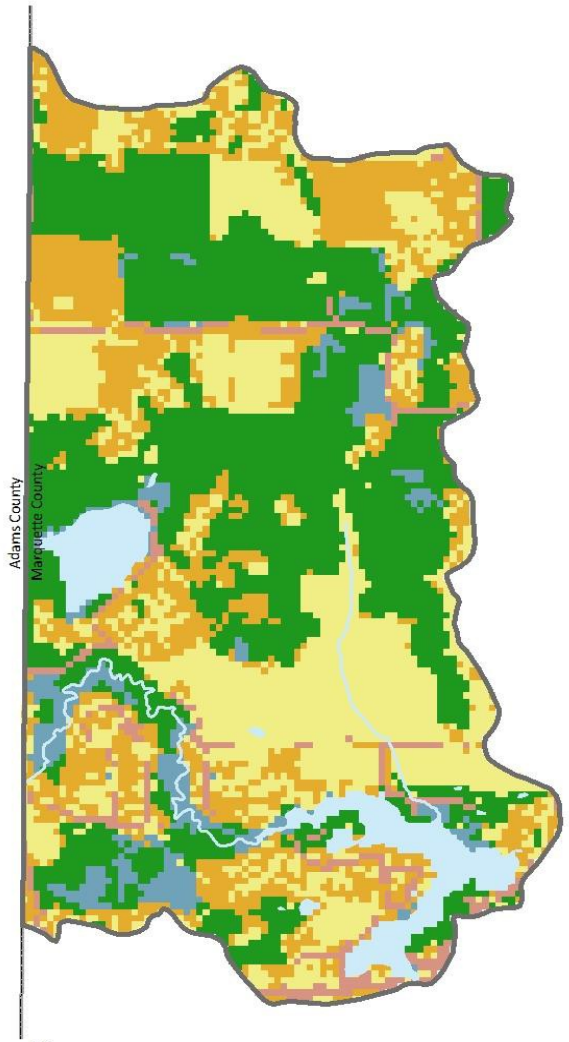
Appendix 1

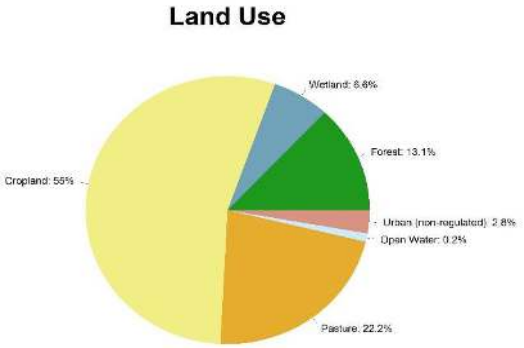
Best Management Practices List

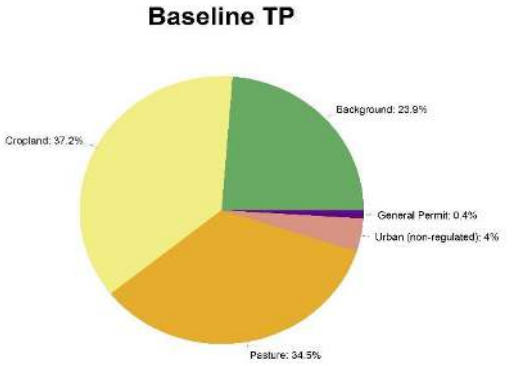
CONSERVATION PRACTICE	ATCP 50 Reference
Manure storage systems	50.62
Manure storage system closure	50.63
Barnyard runoff control systems	50.64
Access roads	50.65
Trails and walkways	50.66
Contour farming	50.67
Cover crop	50.68
Critical area stabilization	50.69
Diversions	50.70
Feed storage runoff control systems	50.705
Field windbreaks	50.71
Filter strips	50.72
Grade stabilization structures	50.73
Livestock fencing	50.75
Livestock watering facilities	50.76
Milking center waste control systems	50.77
Nutrient management	50.78
Pesticide management	50.79
Prescribed grazing	50.80
Relocating or abandoning animal feeding operations	50.81
Residue management	50.82
Riparian buffers	50.83
Roofs	50.84
Roof runoff systems	50.85
Sediment basins	50.86
Sinkhole treatment	50.87
Streambank and shoreline protection	50.88
Strip-cropping	50.89
Subsurface drains	50.90
Terrace systems	50.91
Underground outlets	50.92
Waste transfer systems	50.93
Wastewater treatment strips	50.94
Water and sediment control basins	50.95
Waterway systems	50.96
Well decommissioning	50.97
Wetland development or restoration	50.98

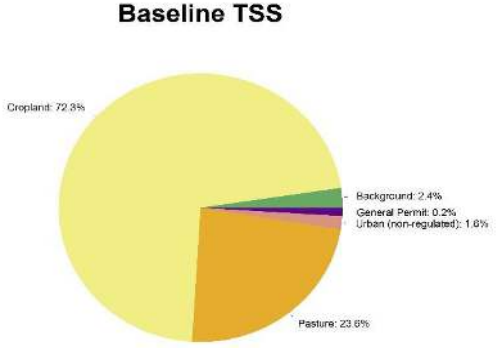
Appendix 2 HUC 12: 040302010201 – Neenah Lake-Neenah Creek

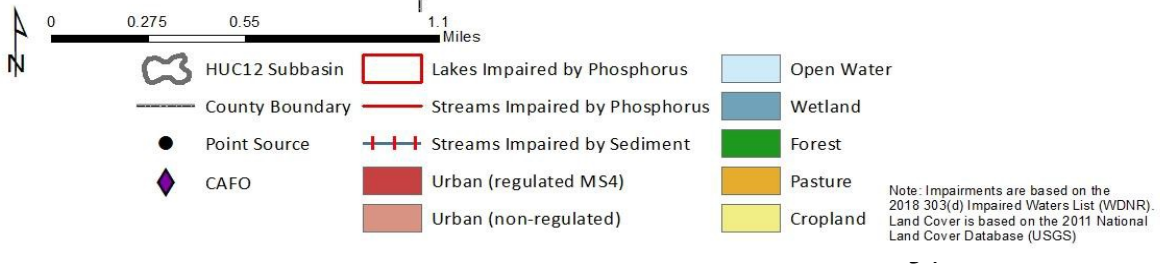




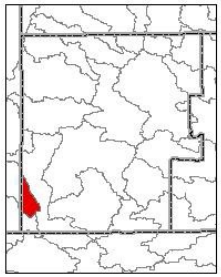


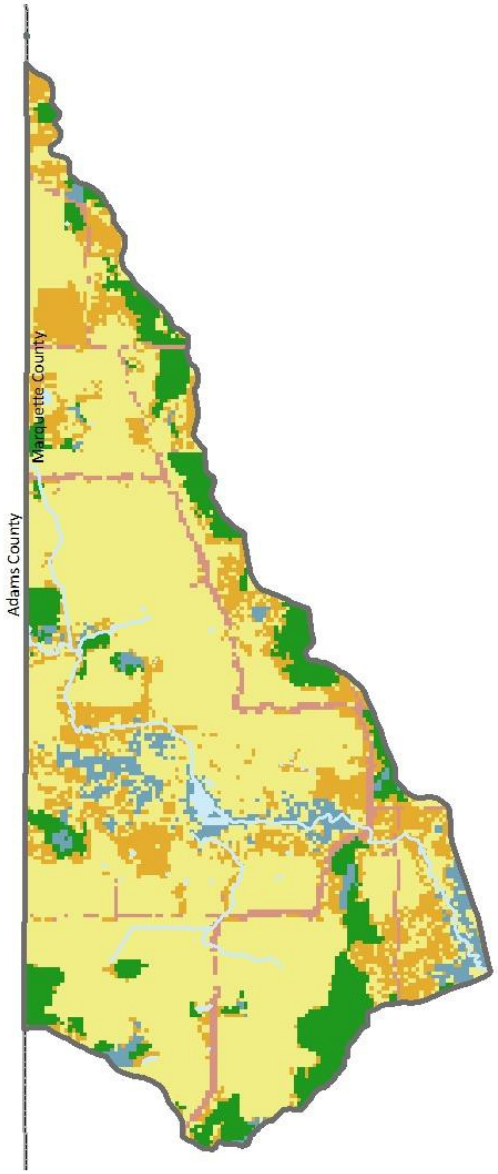


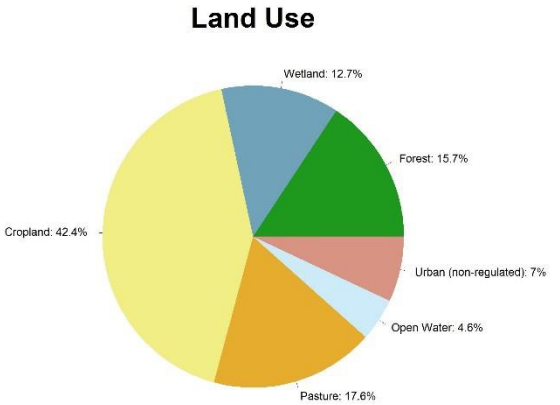


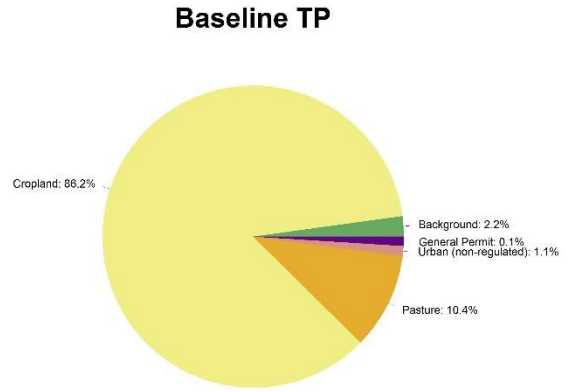


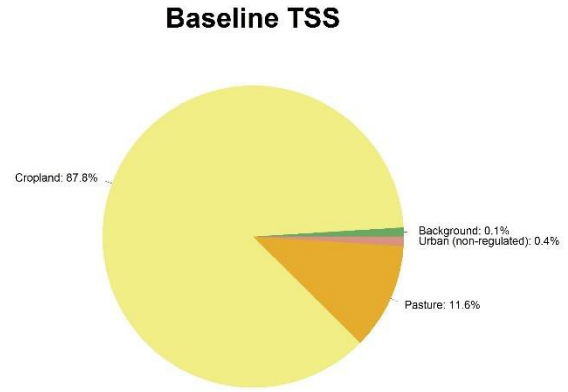
Appendix 3 HUC 12: 040302010202 – Green Creek

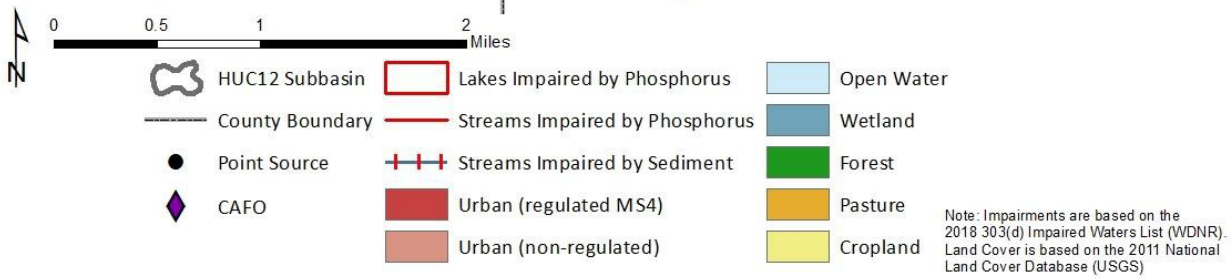




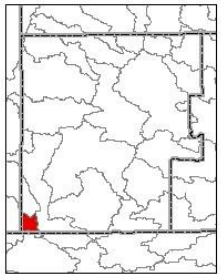


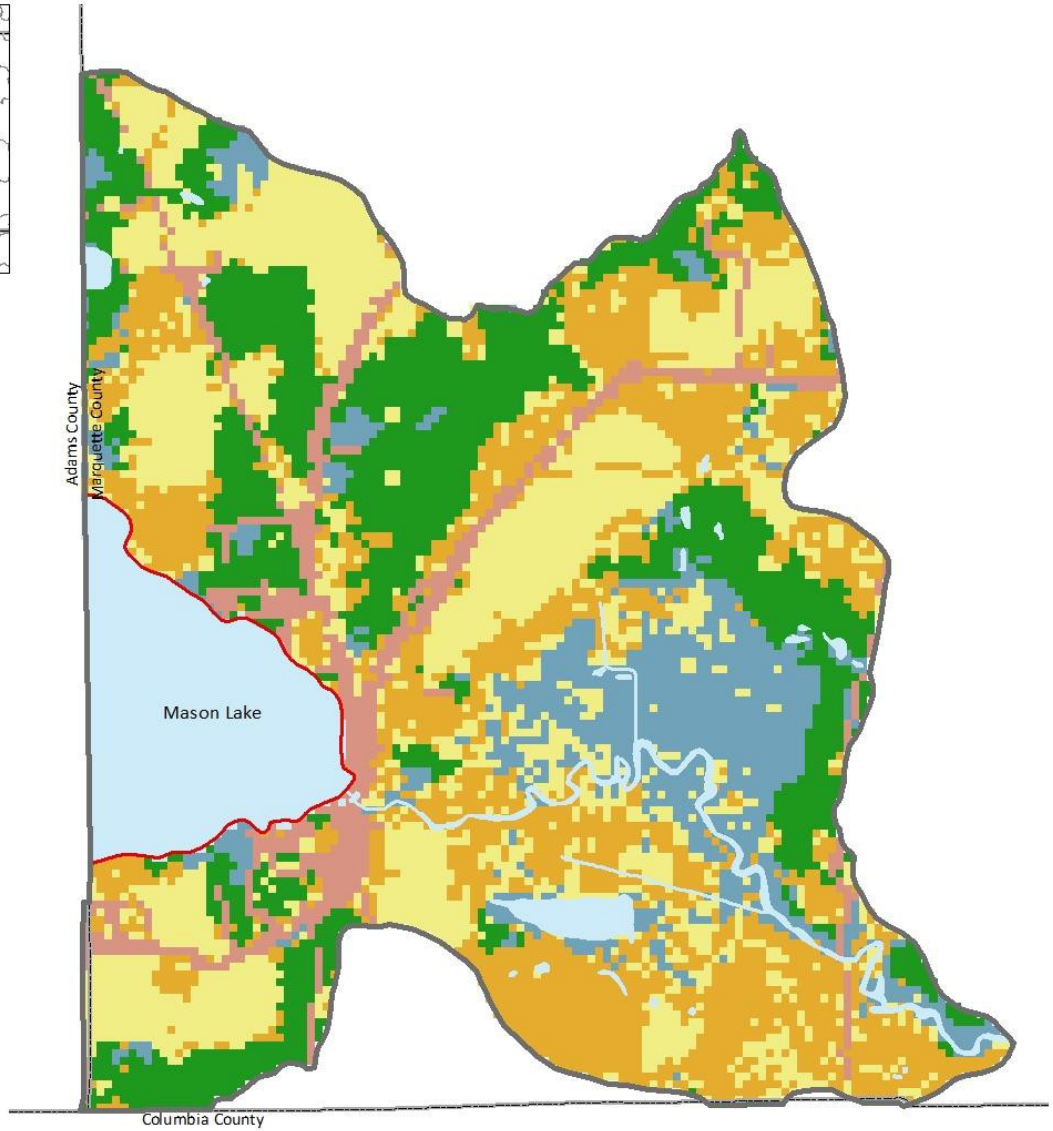


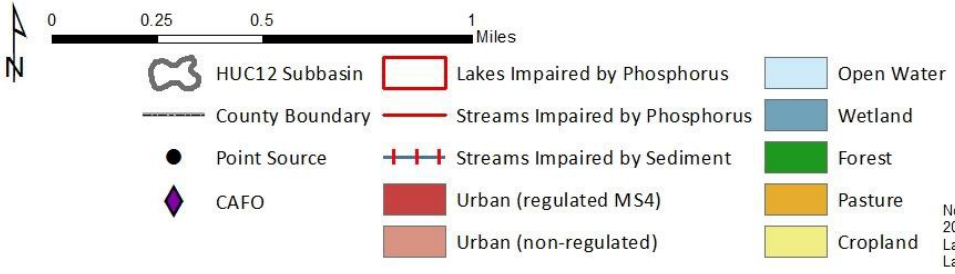




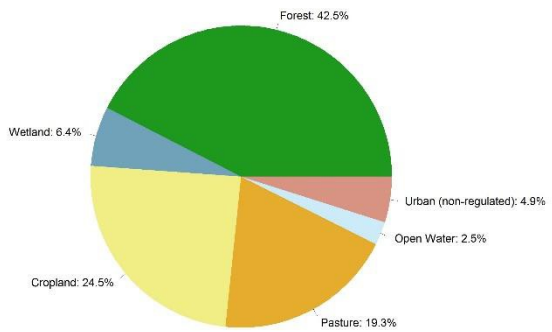
Appendix 4 HUC 12: 040302010203 – South Branch Neenah Creek



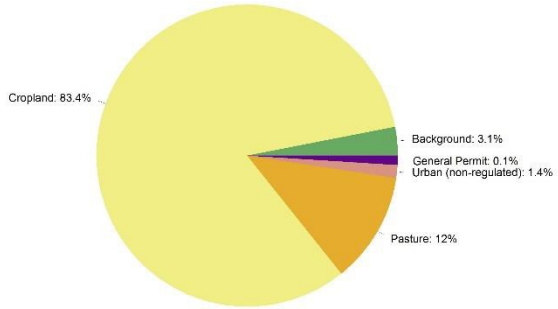




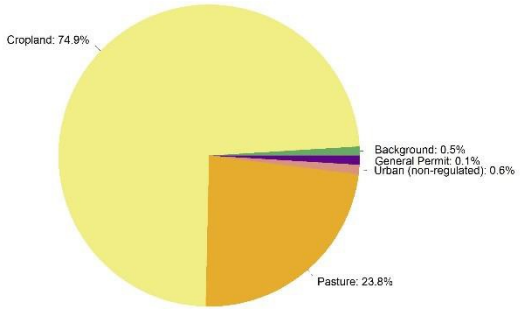
Land Use



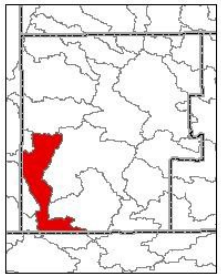
Baseline TP

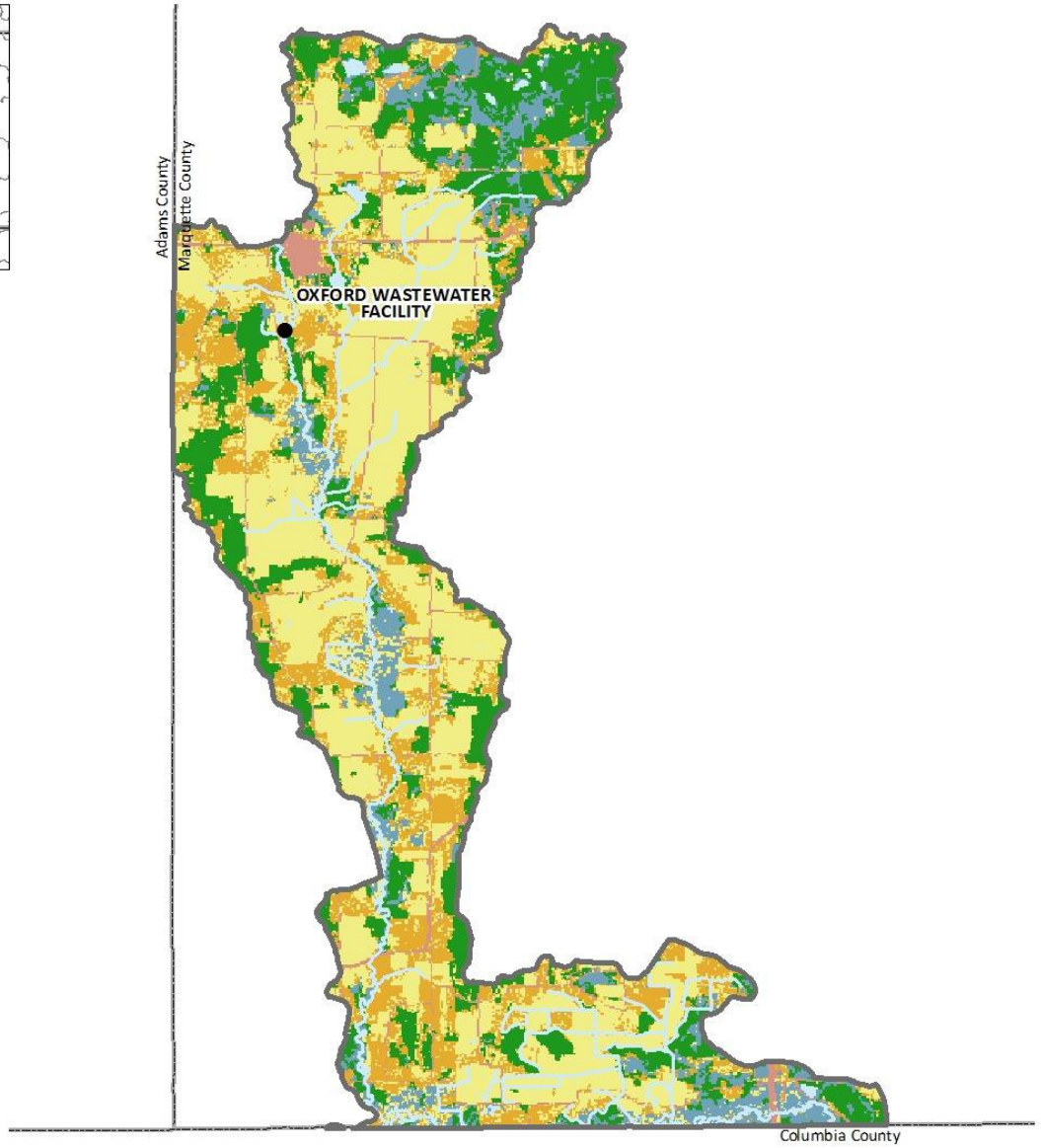


Baseline TSS

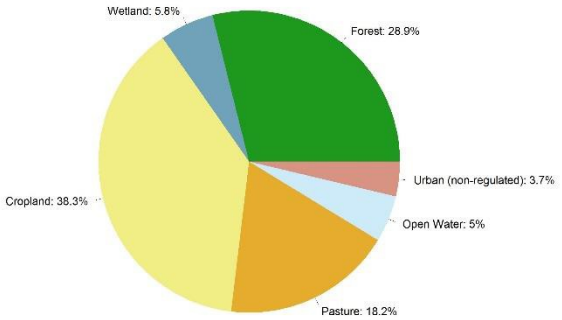


Appendix 5 HUC 12: 040302010205 – Neenah Creek

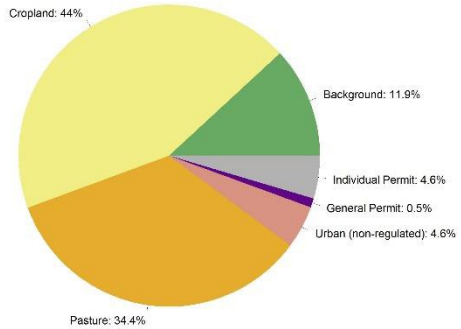




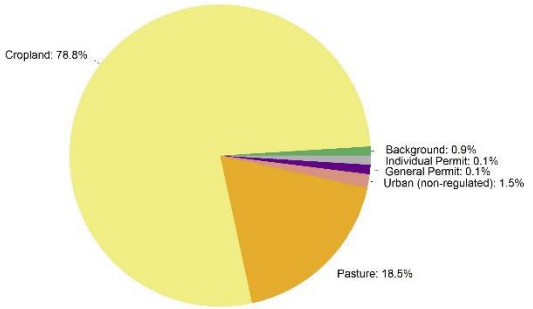
Land Use



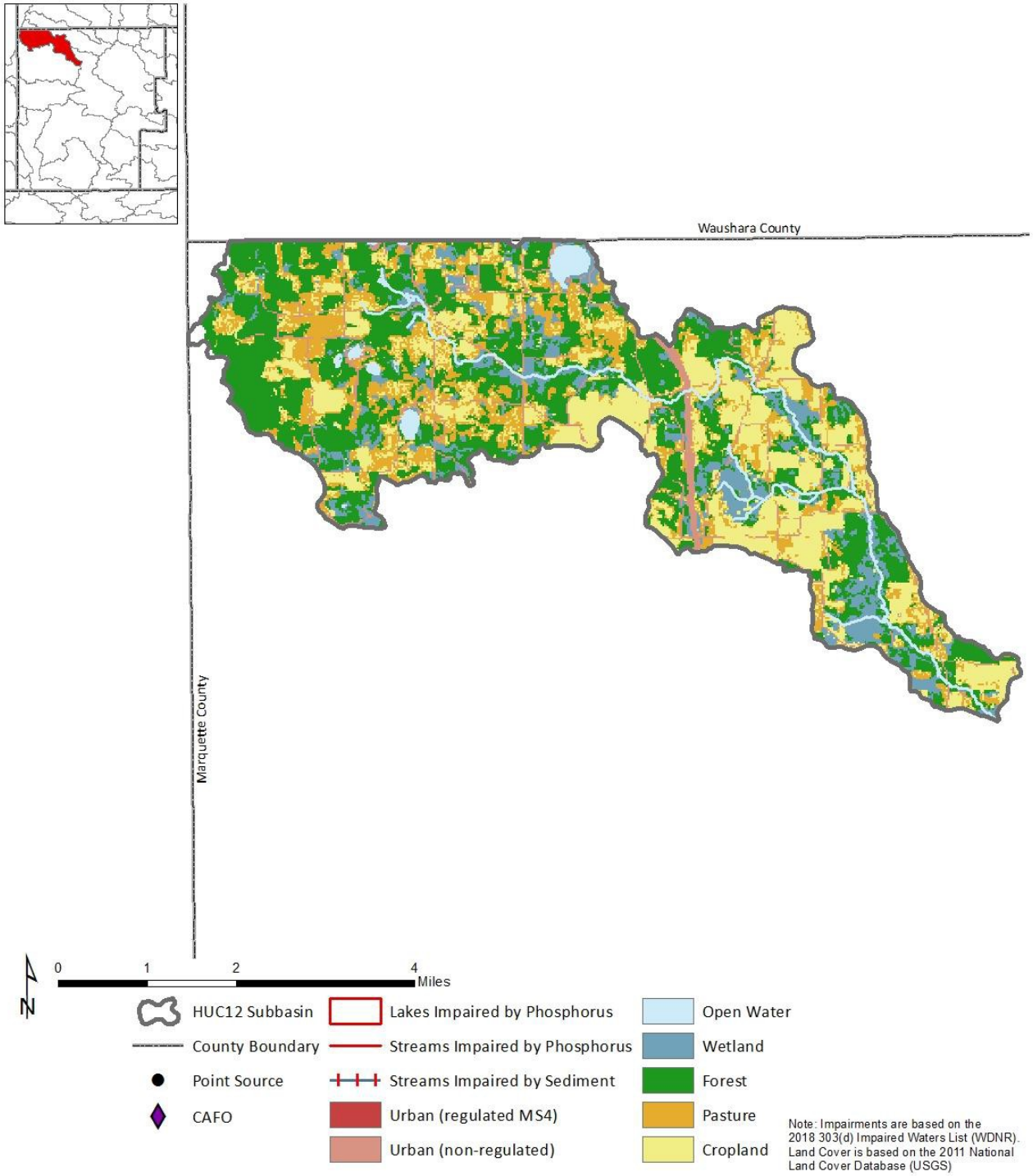
Baseline TP



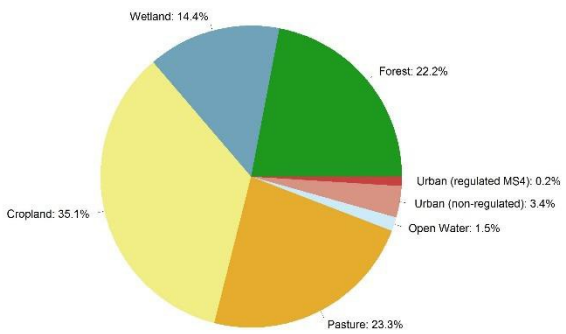
Baseline TSS



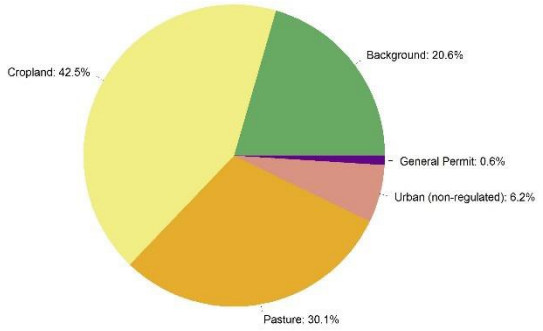
Appendix 6 HUC 12: 040302010301 – Tagatz Creek



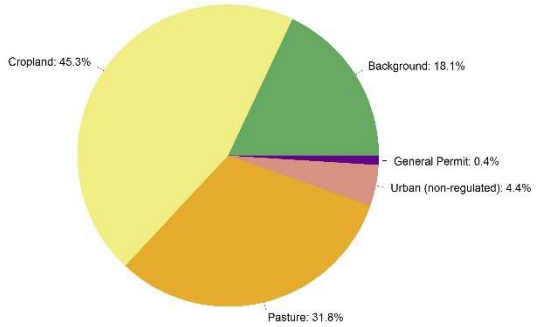
Land Use



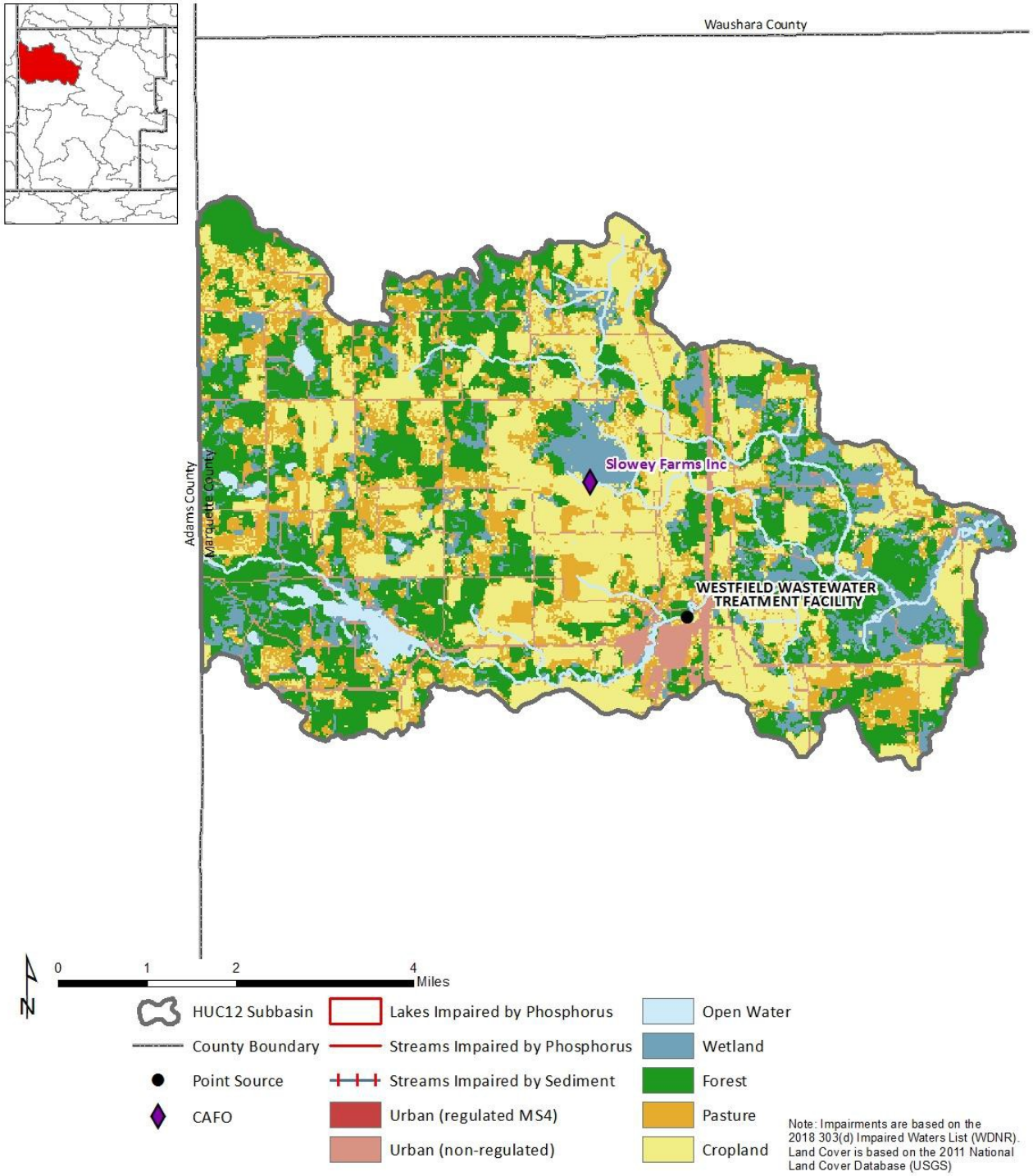
Baseline TP



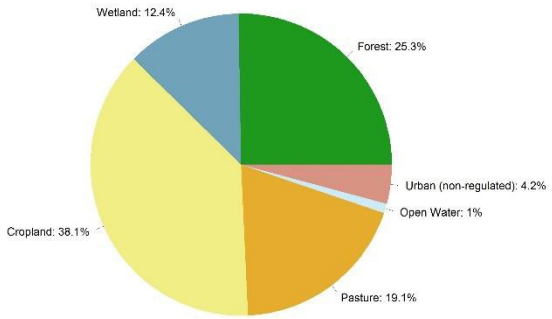
Baseline TSS



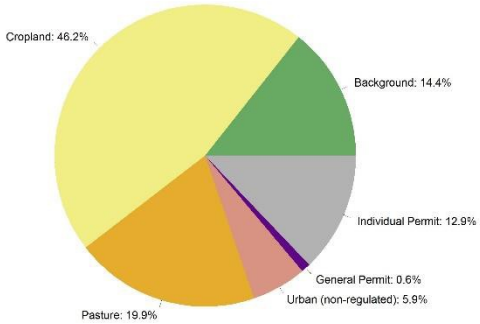
Appendix 7 HUC 12: 040302010302 – Westfield Creek



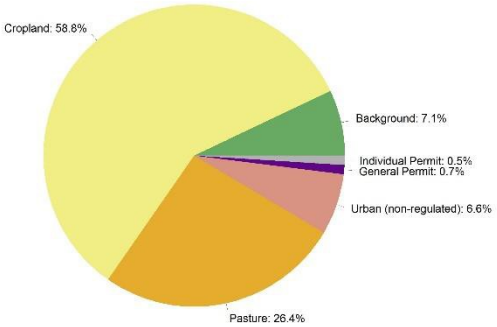
Land Use



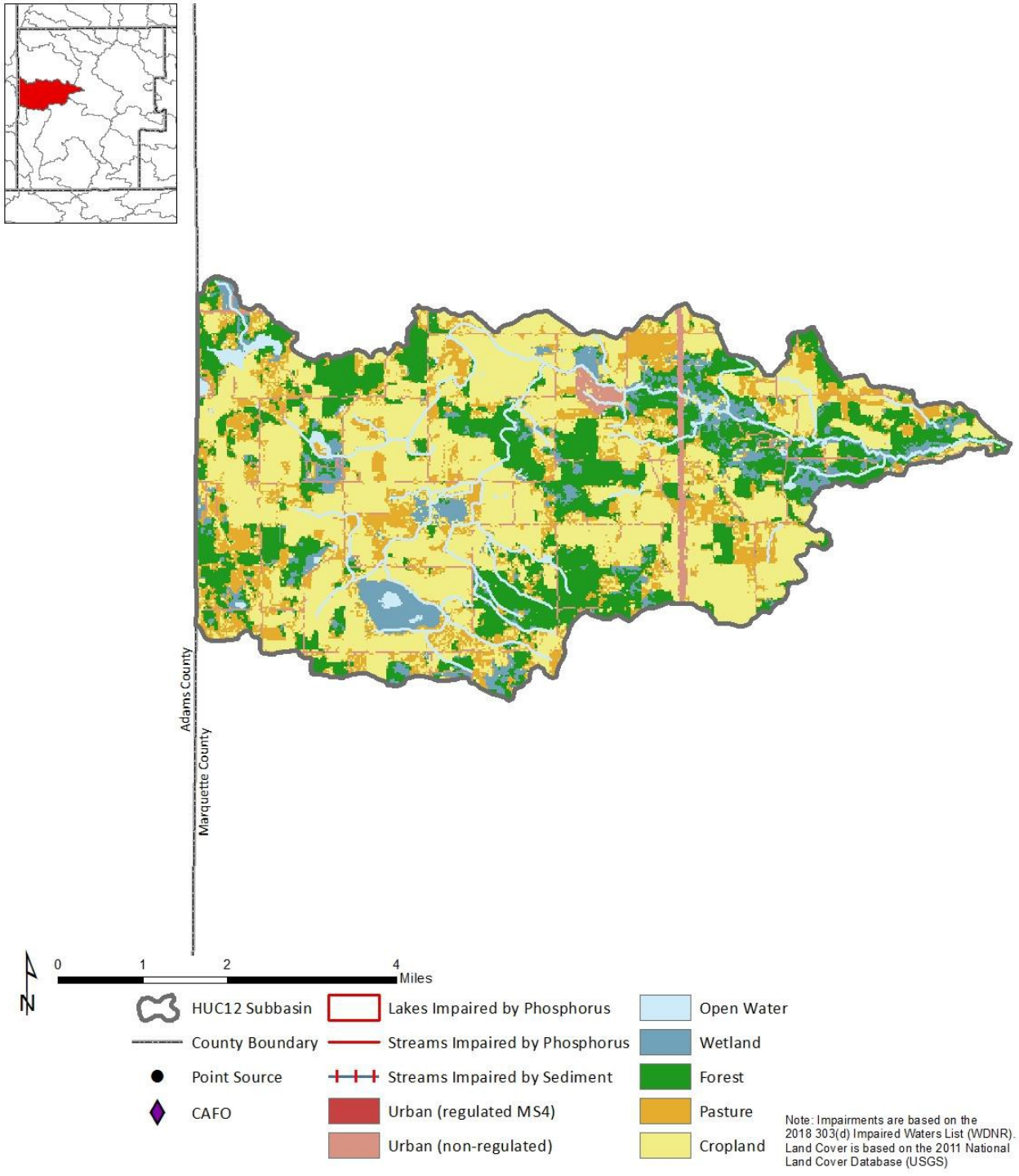
Baseline TP



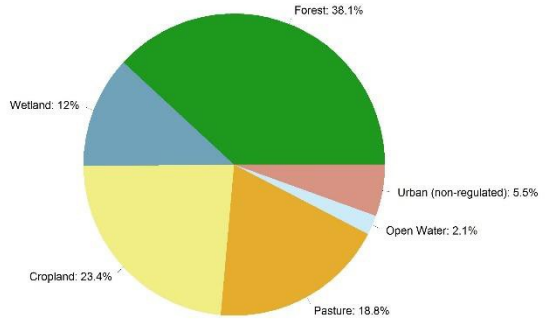
Baseline TSS



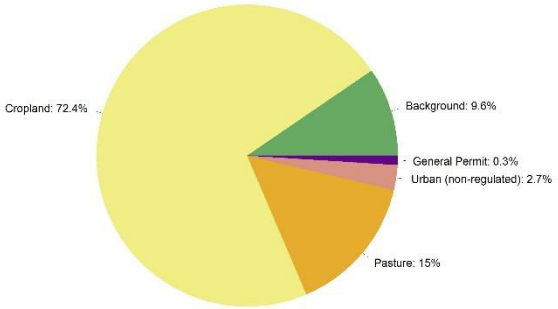
Appendix 8 HUC 12: 040302010303 – Klawitter Creek



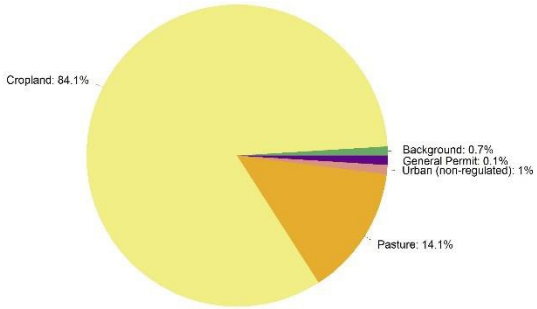
Land Use



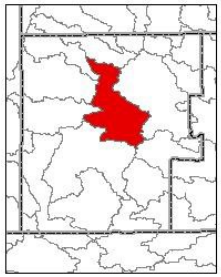
Baseline TP

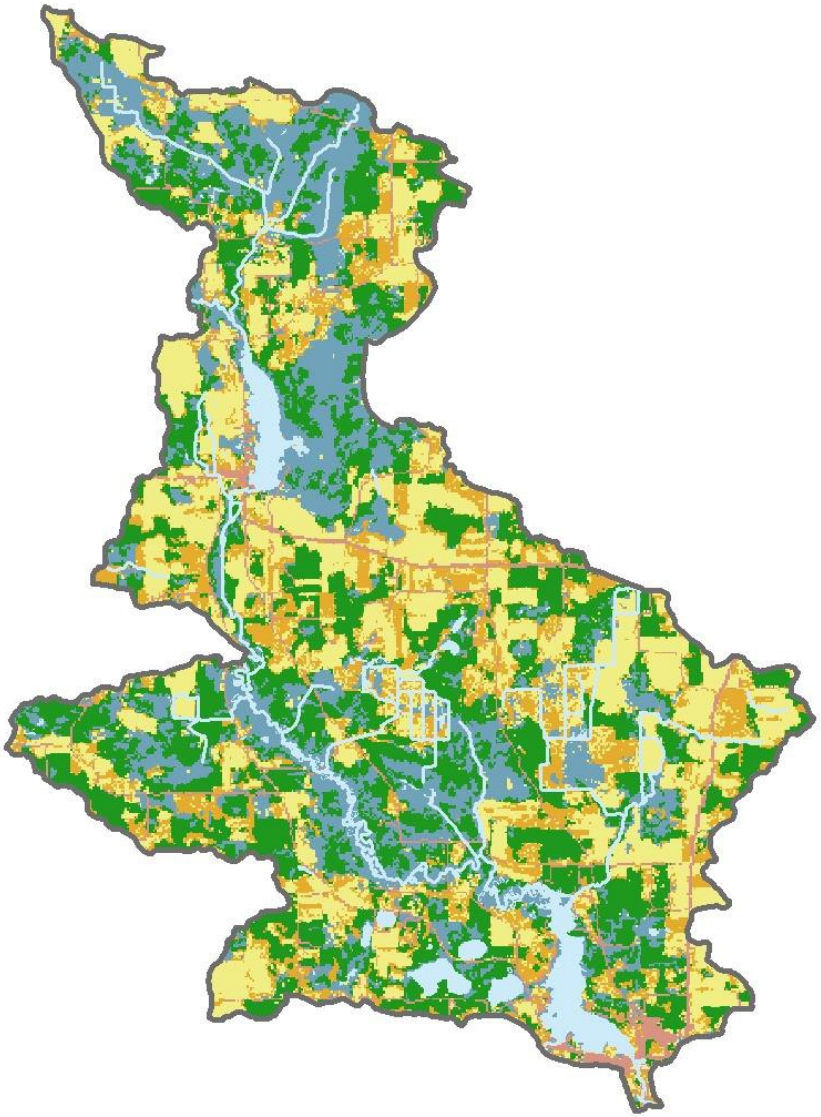


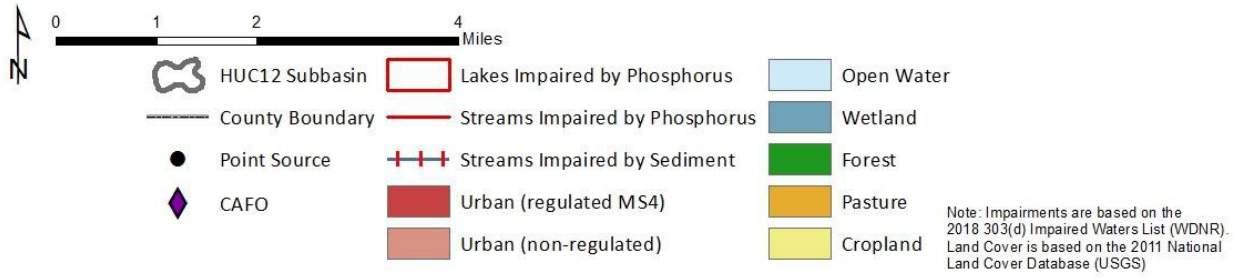
Baseline TSS



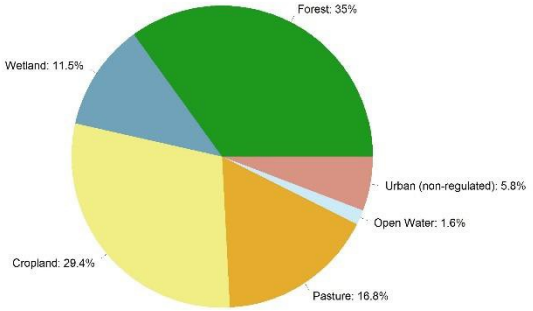
Appendix 9 HUC 12: 040302010304 – Montello River



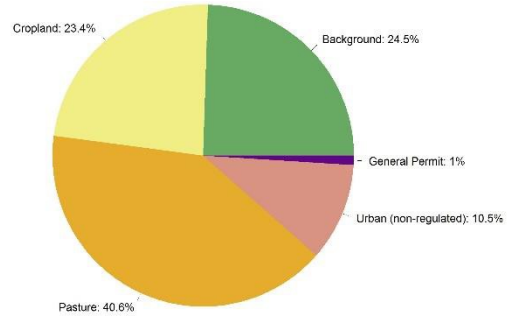




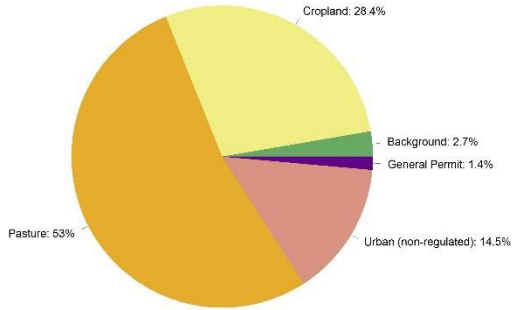
Land Use



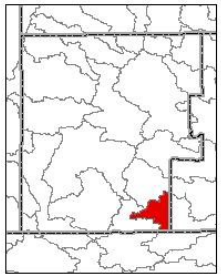
Baseline TP

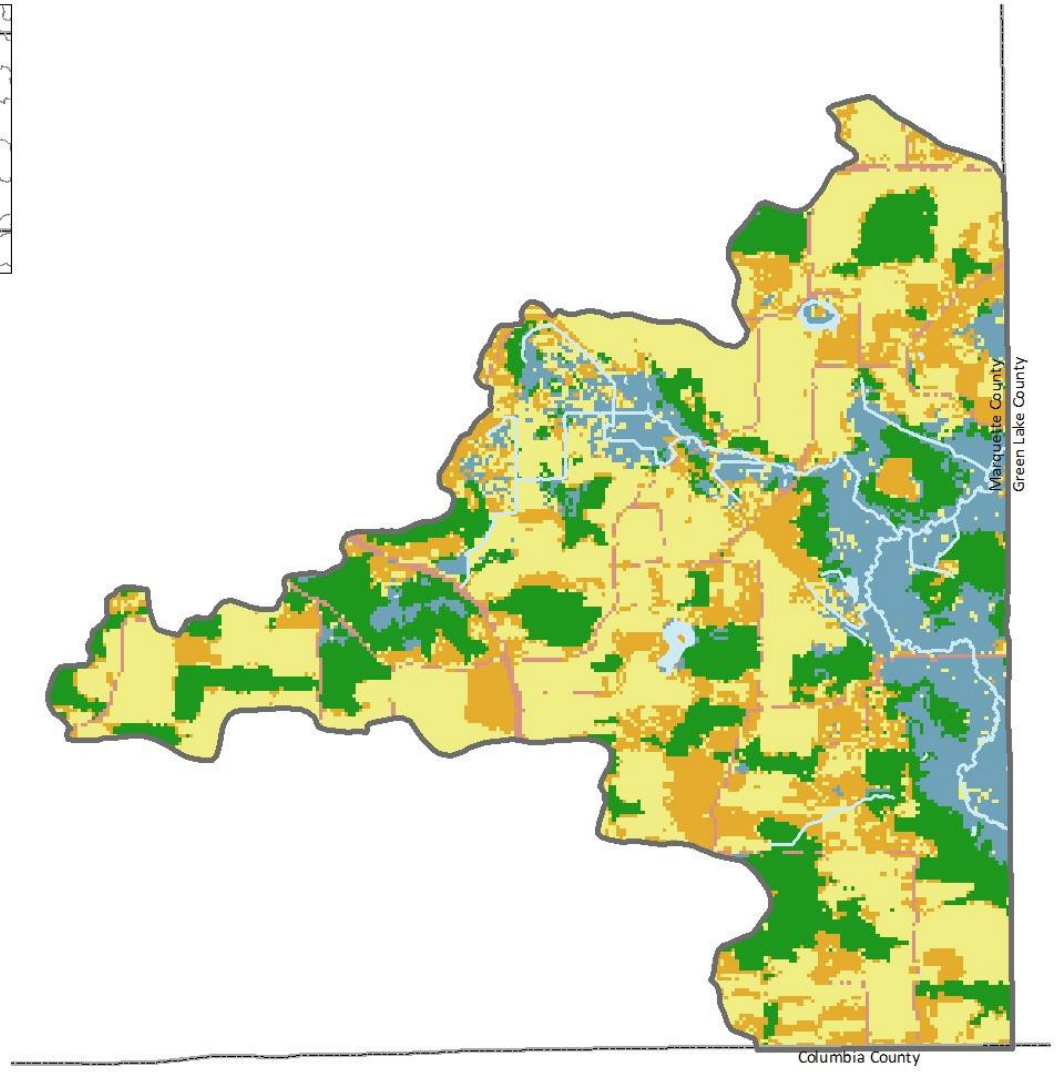


Baseline TSS

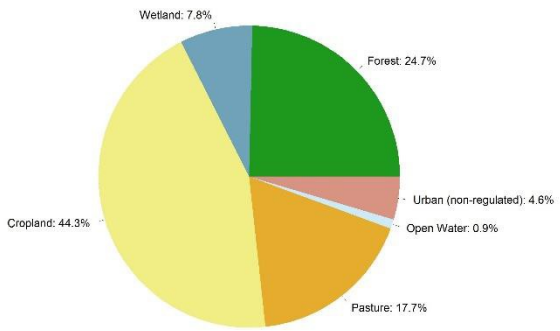


Appendix 10 HUC 12: 040302010503 – Belle Fountain Creek

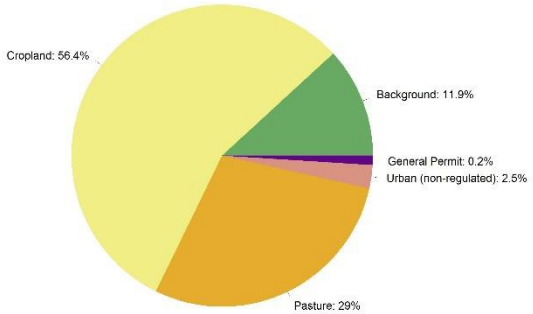




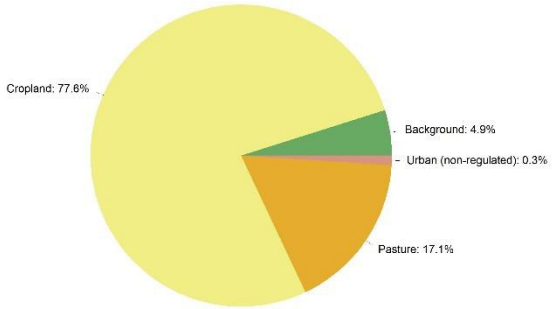
Land Use

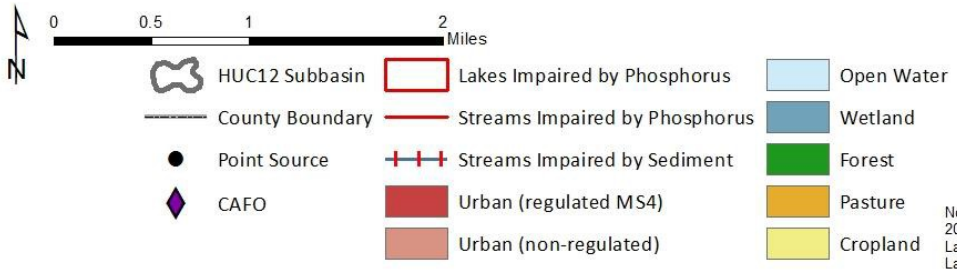


Baseline TP

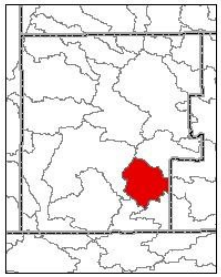


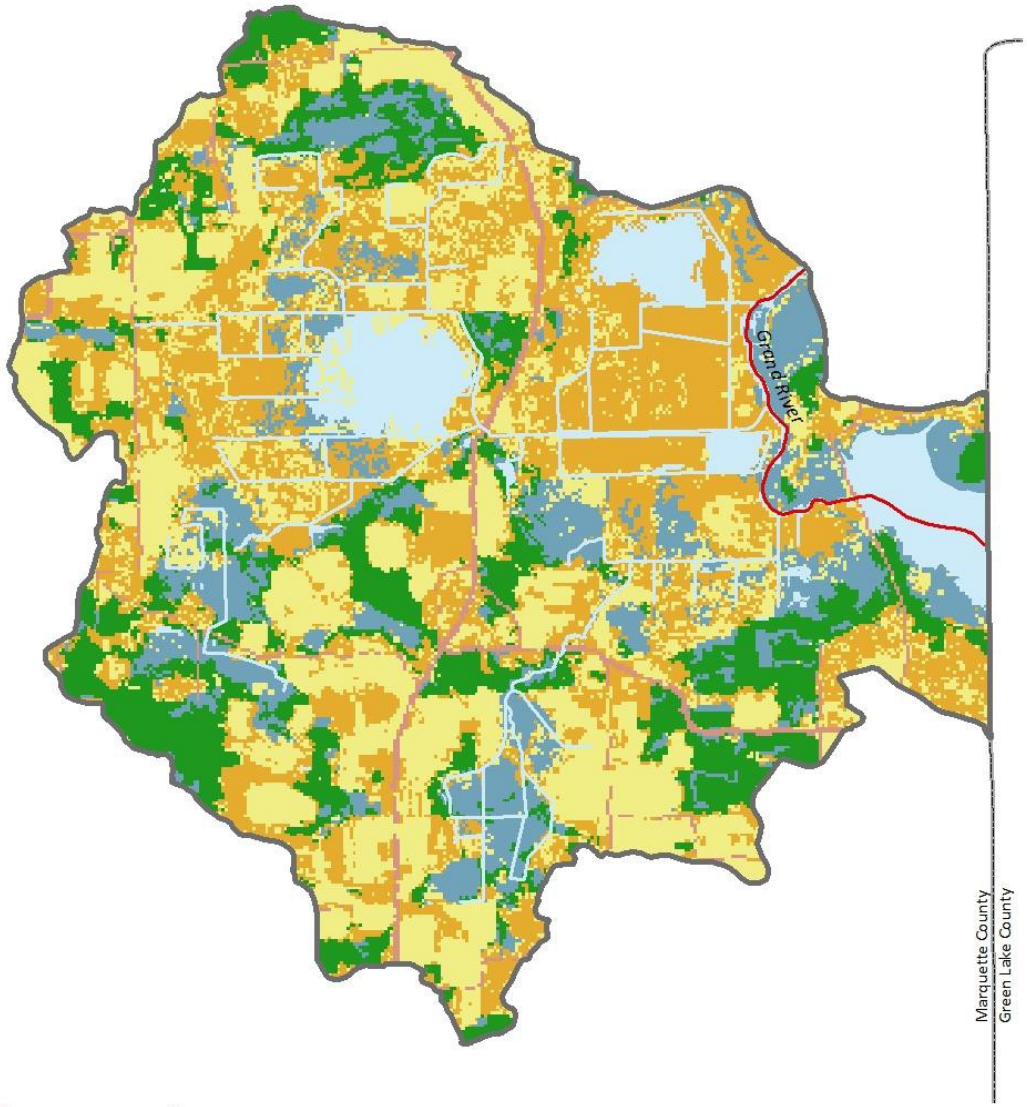
Baseline TSS



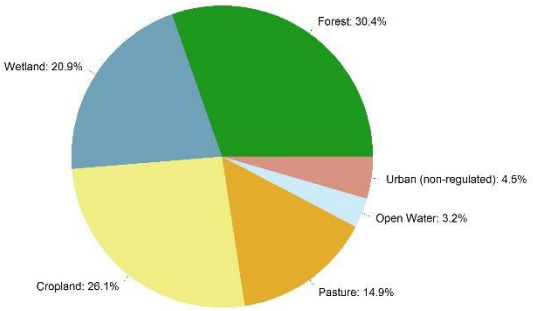


Appendix 11 HUC 12: 040302010504 – Grand

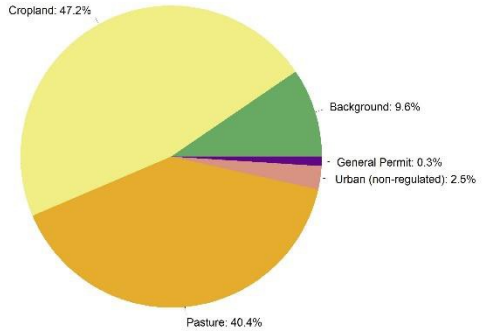




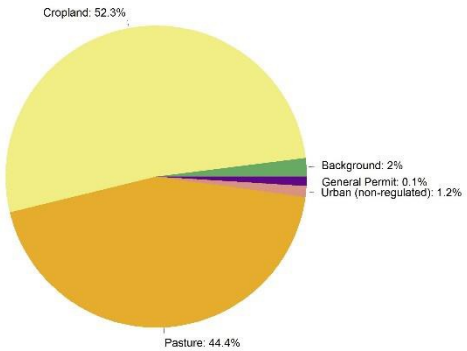
Land Use

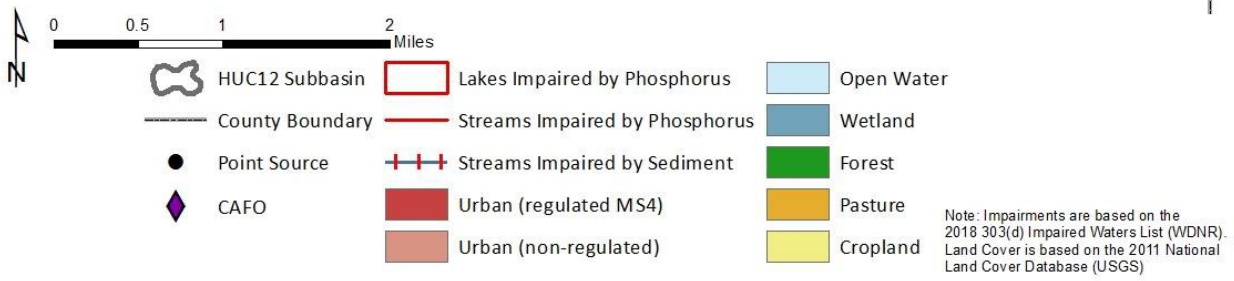


Baseline TP

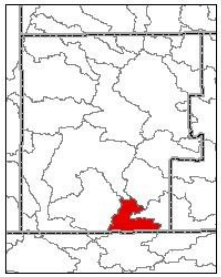


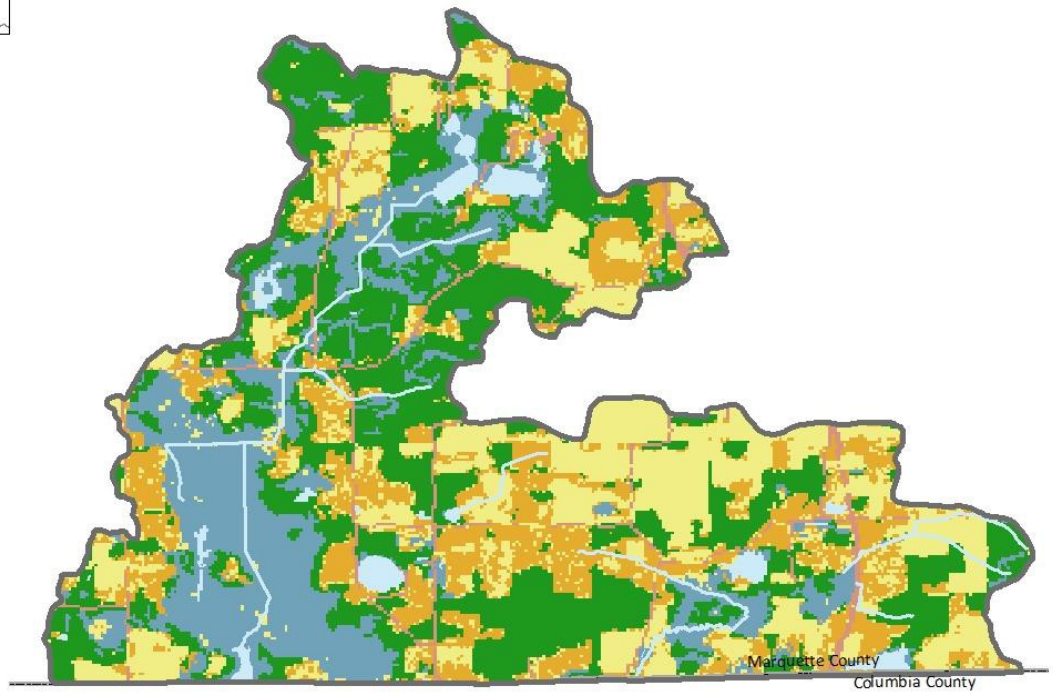
Baseline TSS

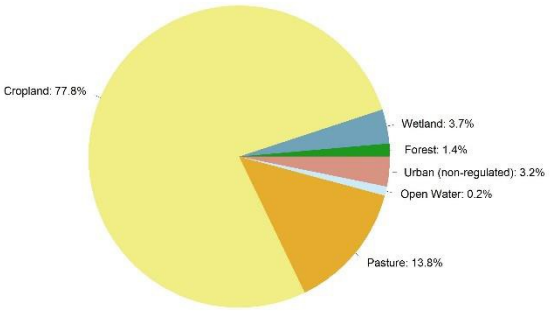


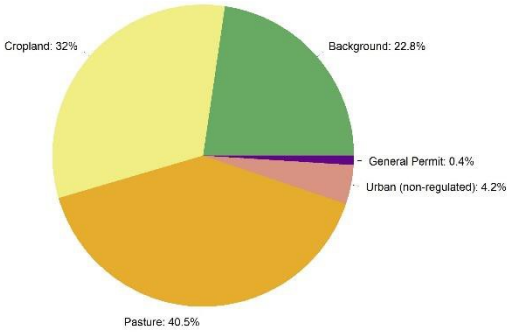


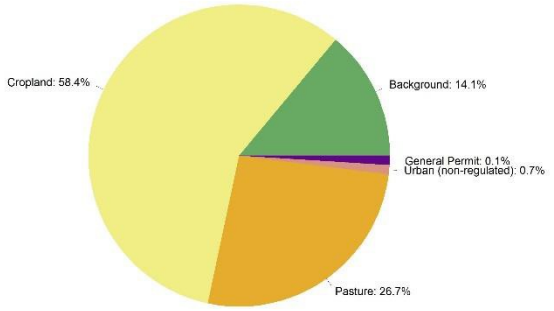
Appendix 12 HUC 12: 040302010602 – French

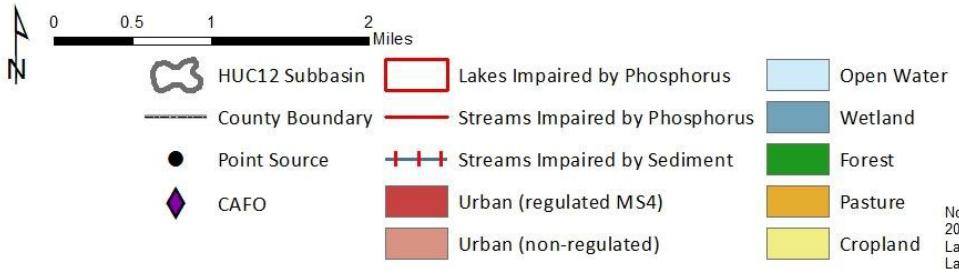




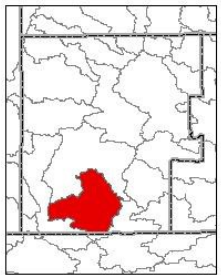


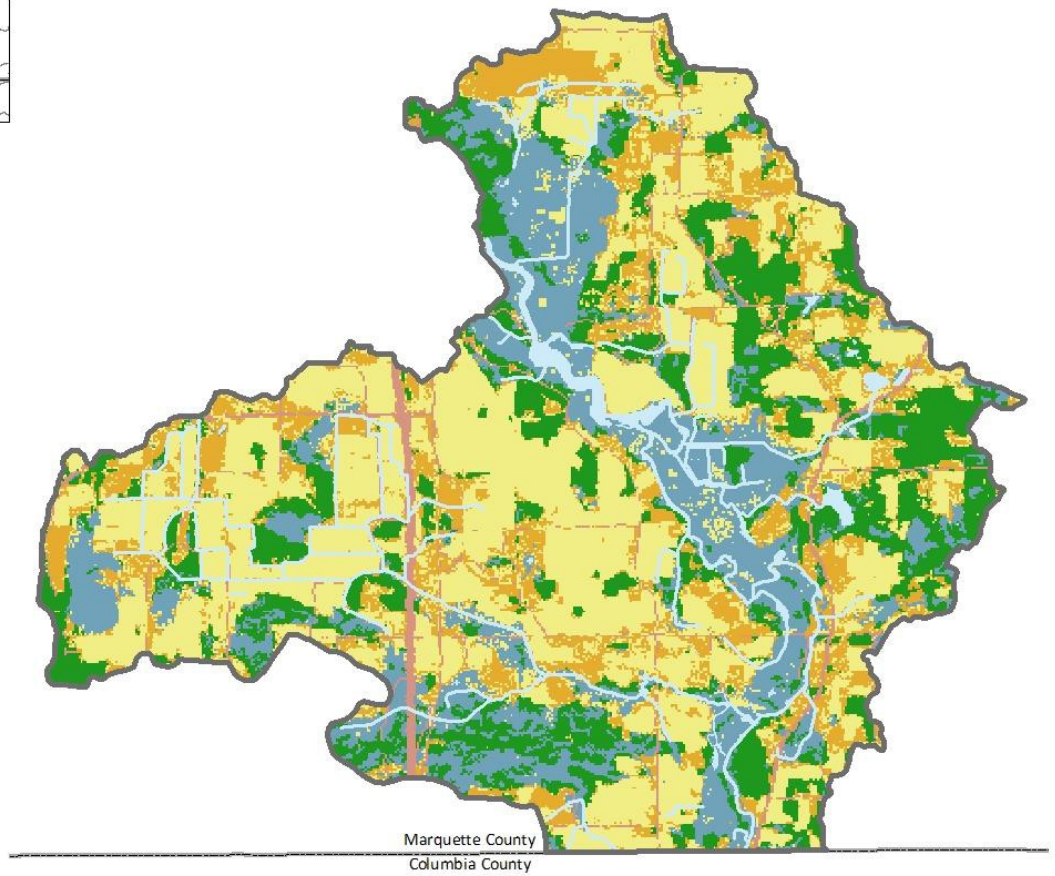


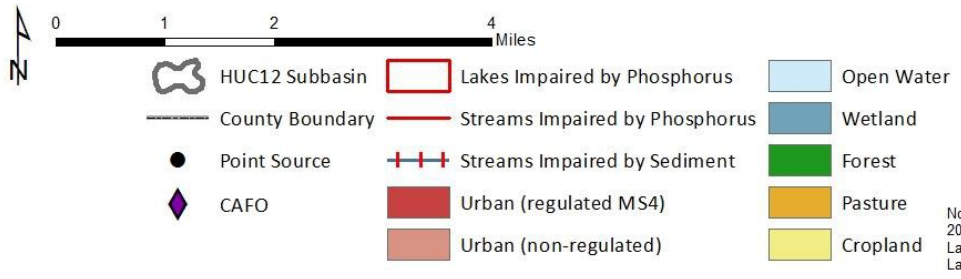




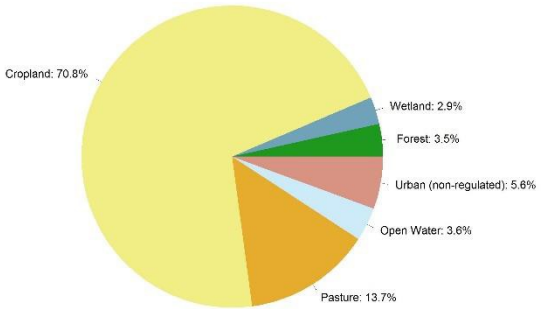
Appendix 13 HUC 12: 040302010603 – Good Earth Creek-Fox River



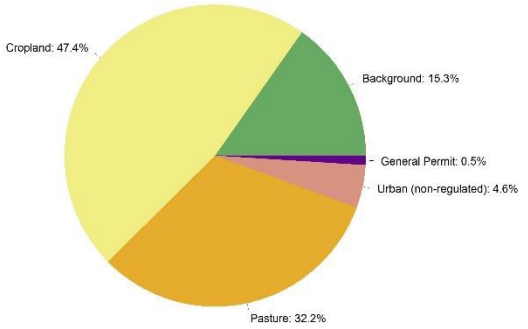




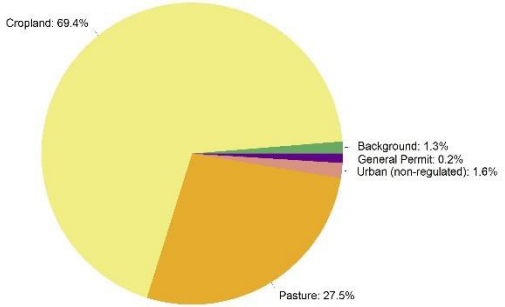
Land Use



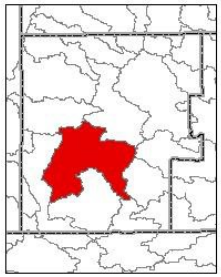
Baseline TP

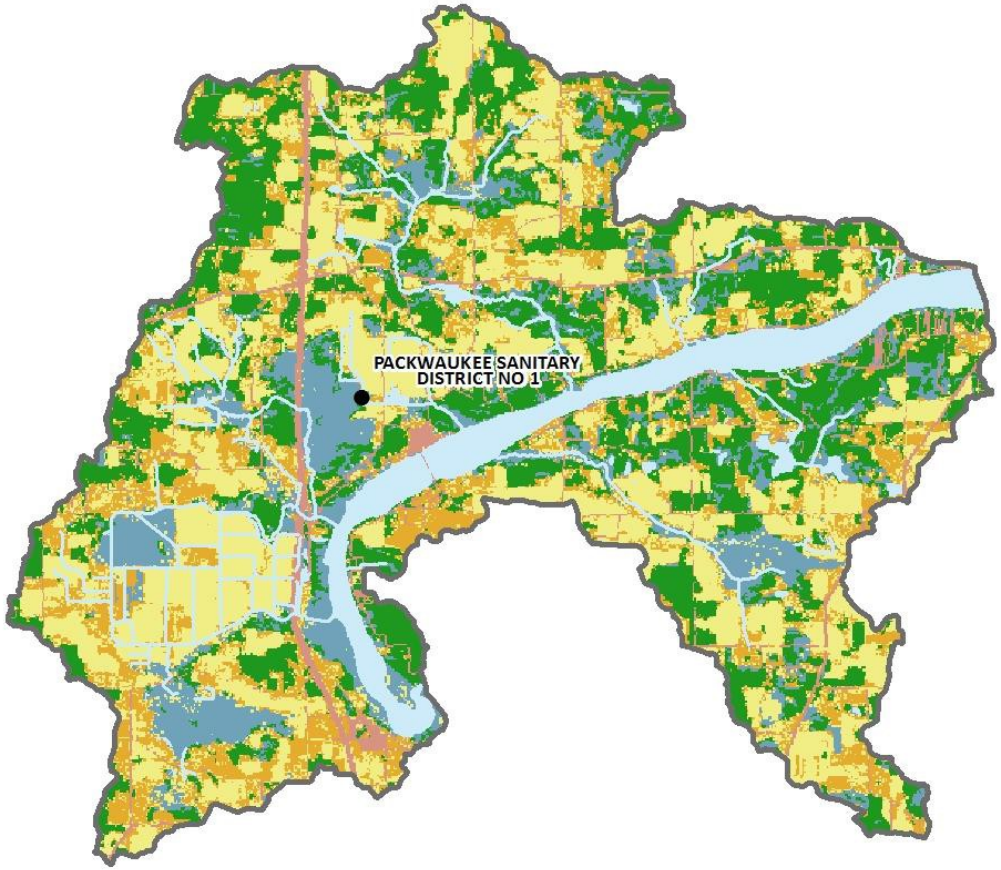


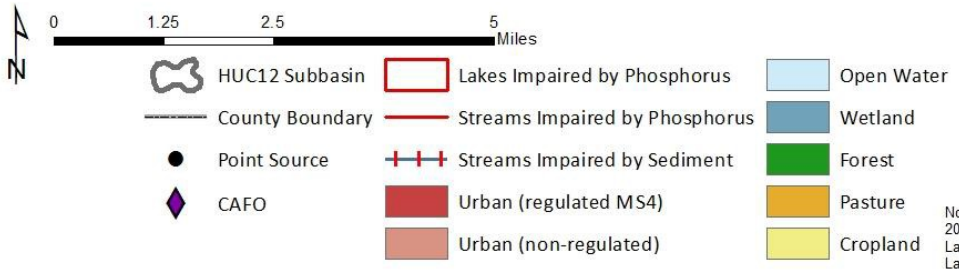
Baseline TSS



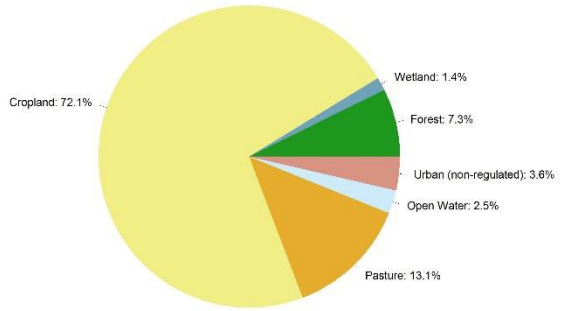
Appendix 14 HUC 12: 040302010604 – Buffalo Lake-Fox River



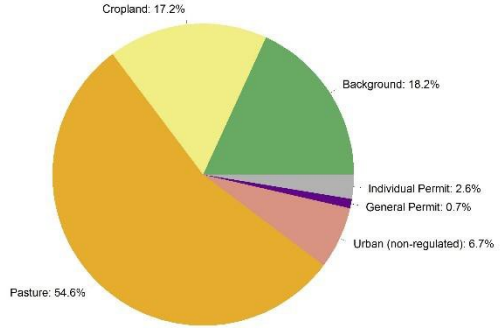




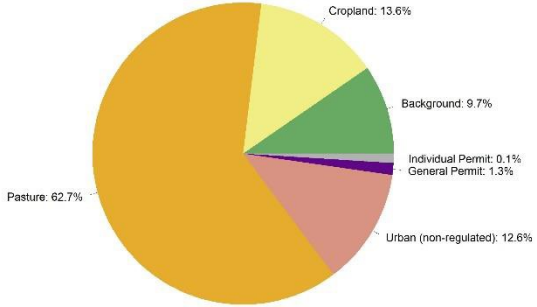
Land Use



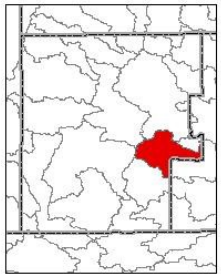
Baseline TP

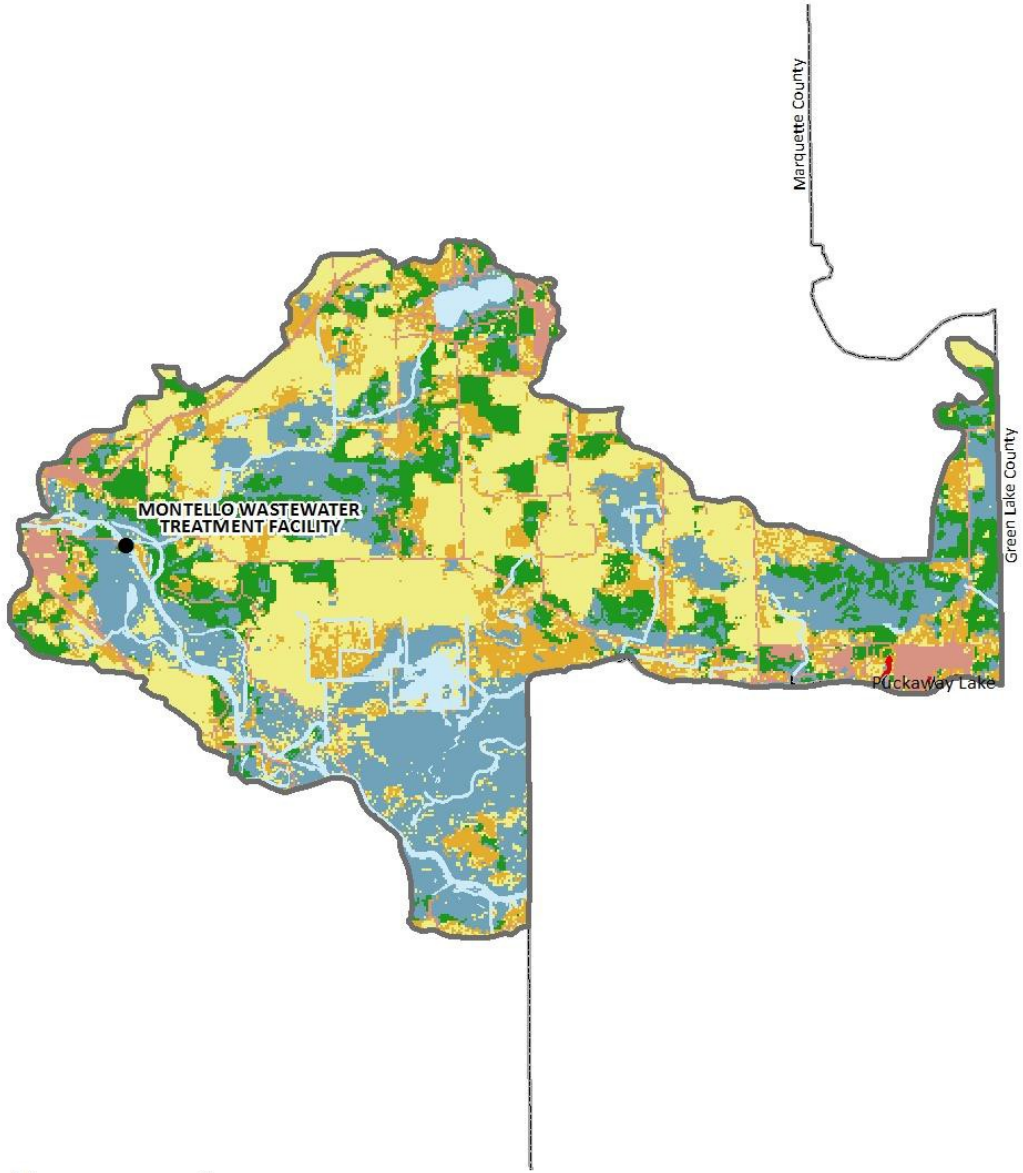


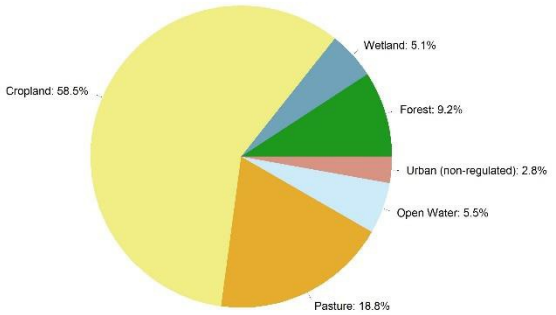
Baseline TSS

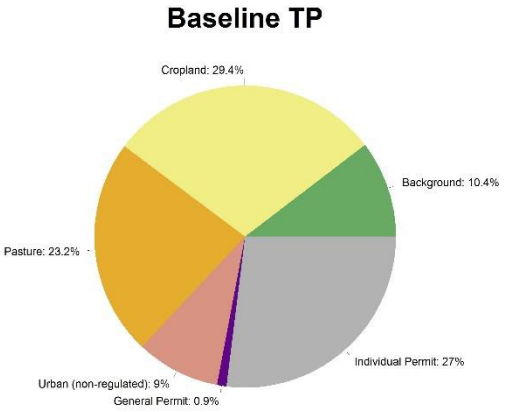


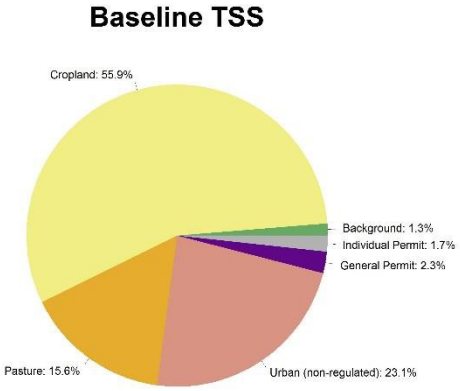
Appendix 15 HUC 12: 040302010605 – Puckaway Lake-Fox River

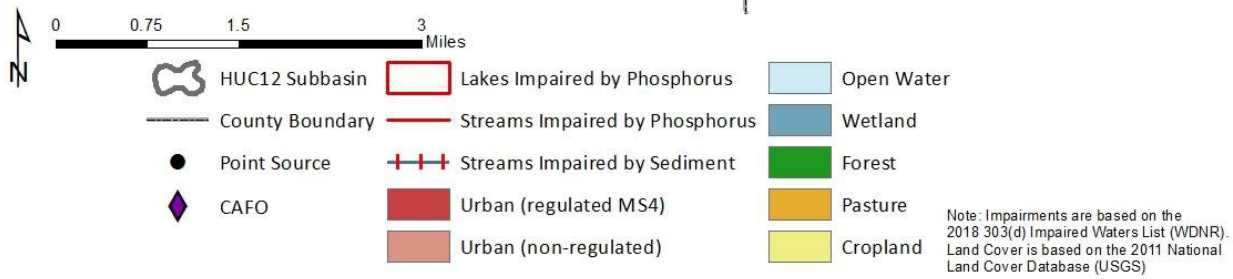




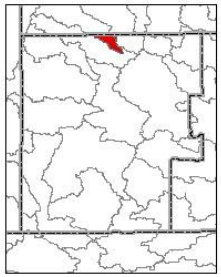


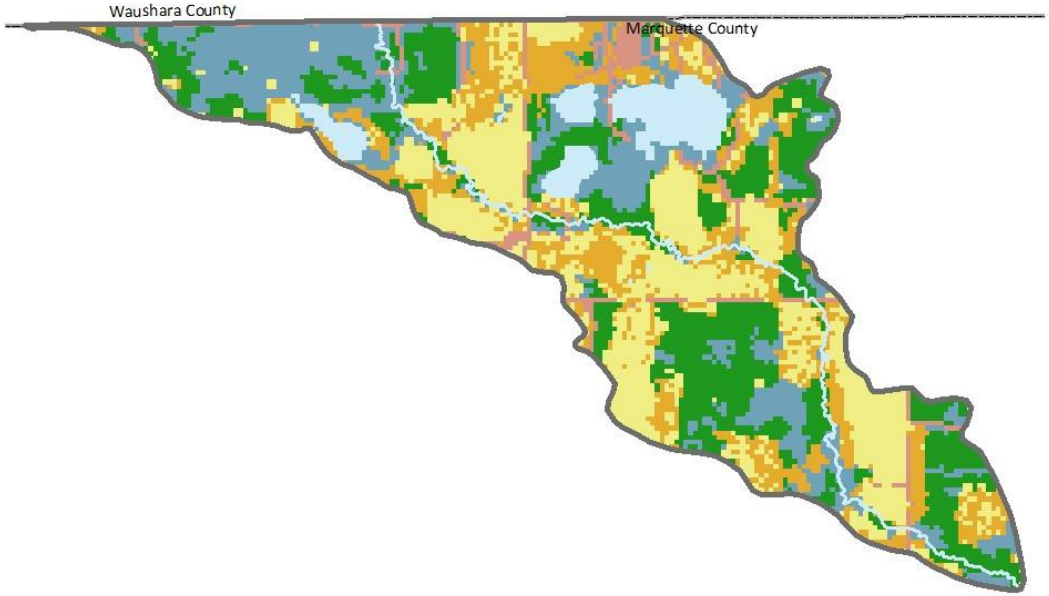


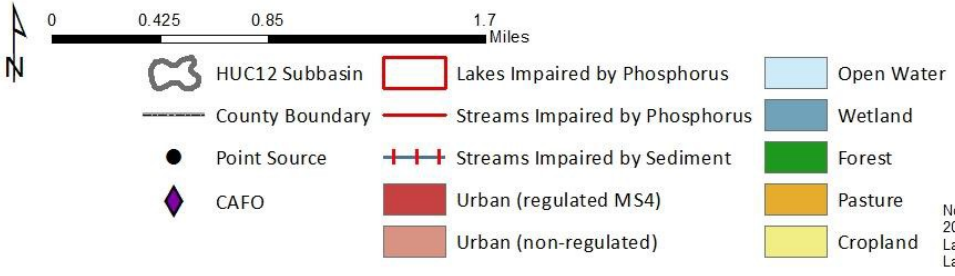




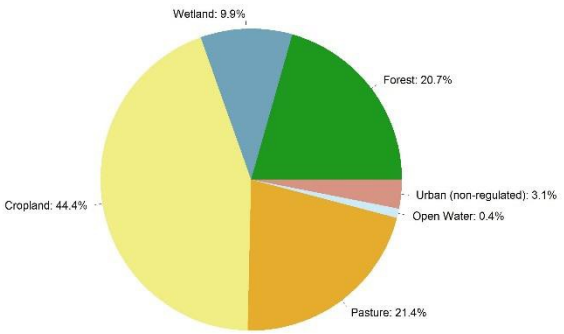
Appendix 16 HUC 12: 040302010701 – Weddle



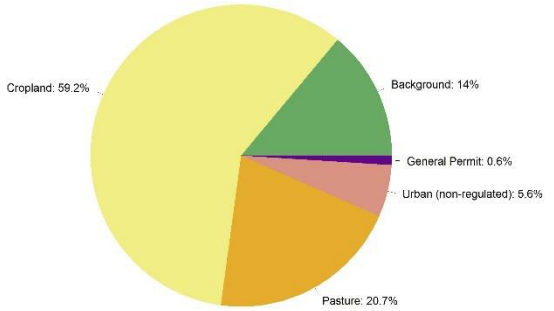




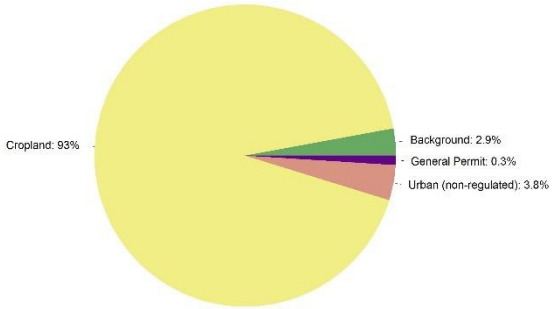
Land Use



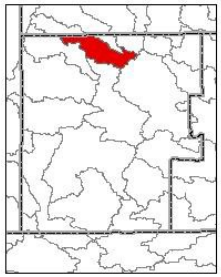
Baseline TP

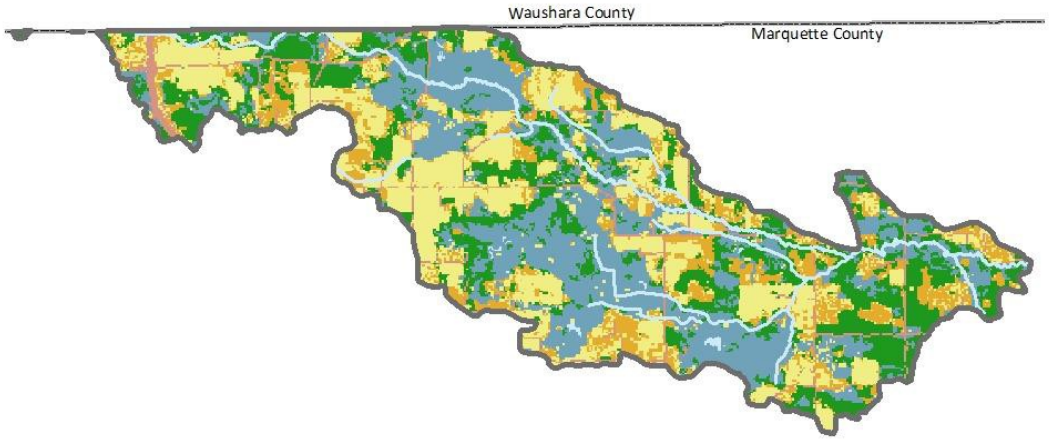


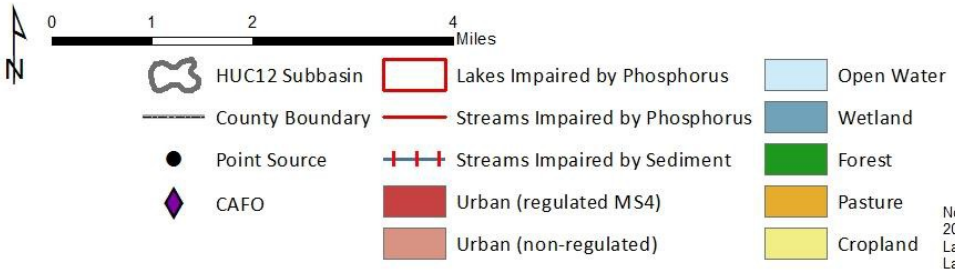
Baseline TSS



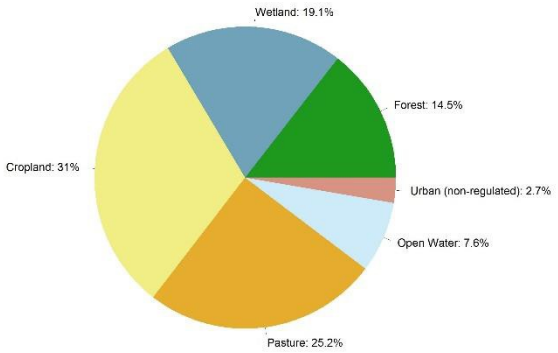
Appendix 17 HUC 12: 040302010702 – Chafee



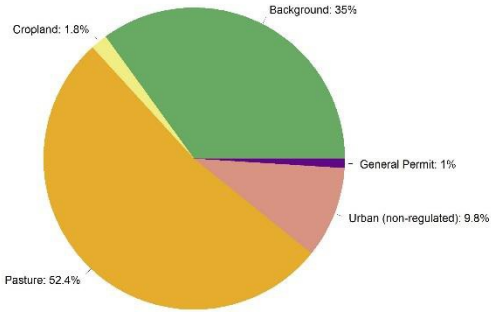




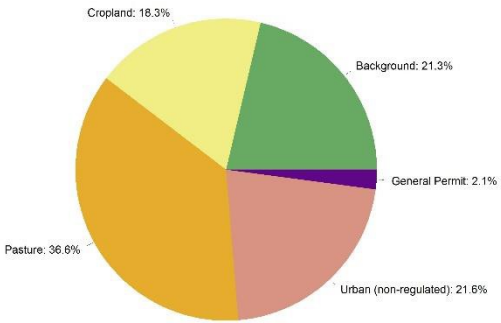
Land Use



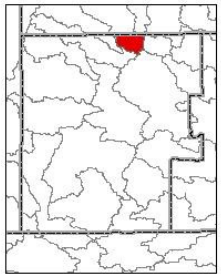
Baseline TP

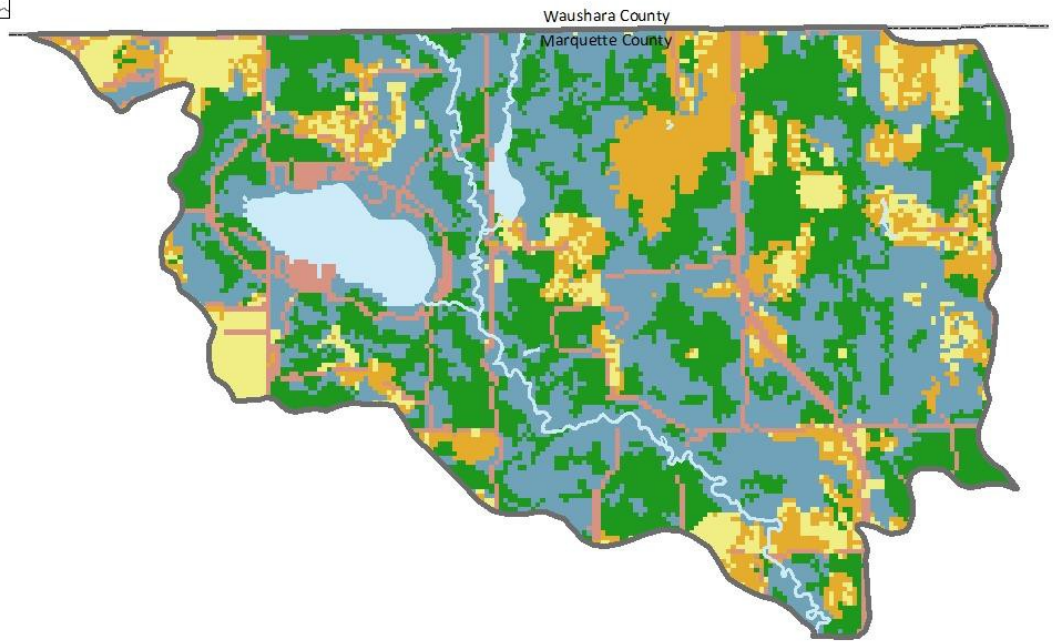


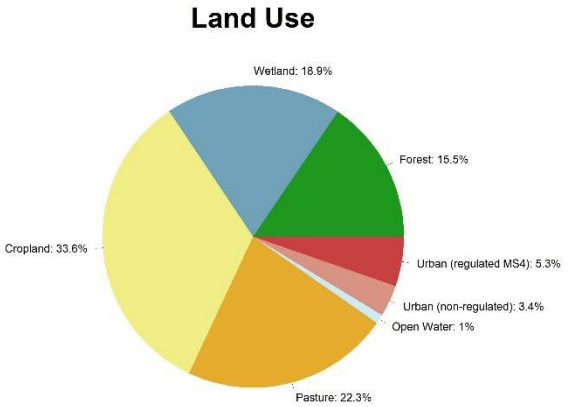
Baseline TSS

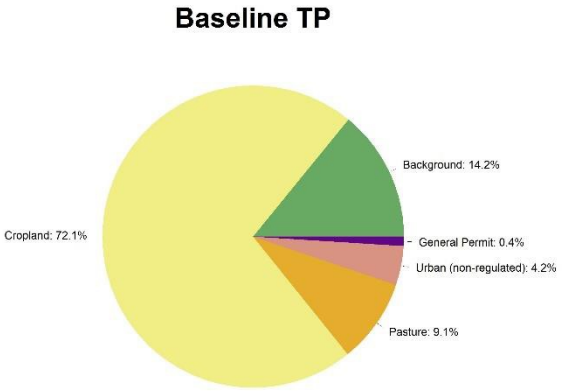


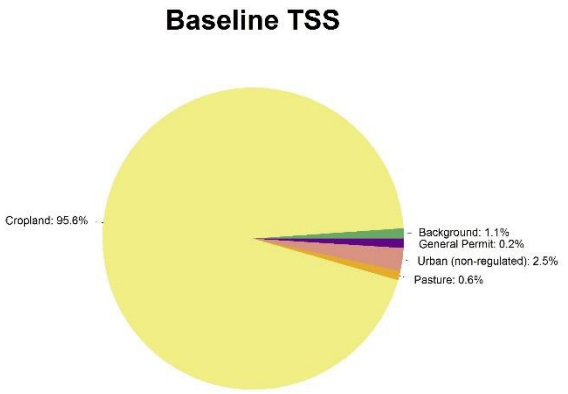
Appendix 18 HUC 12: 040302010703 – Little Pine Creek-Mecan River

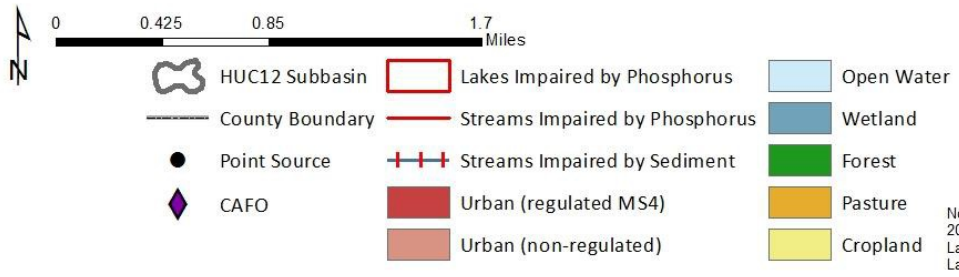




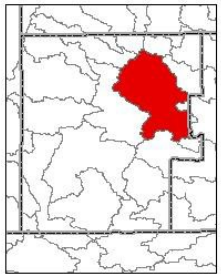


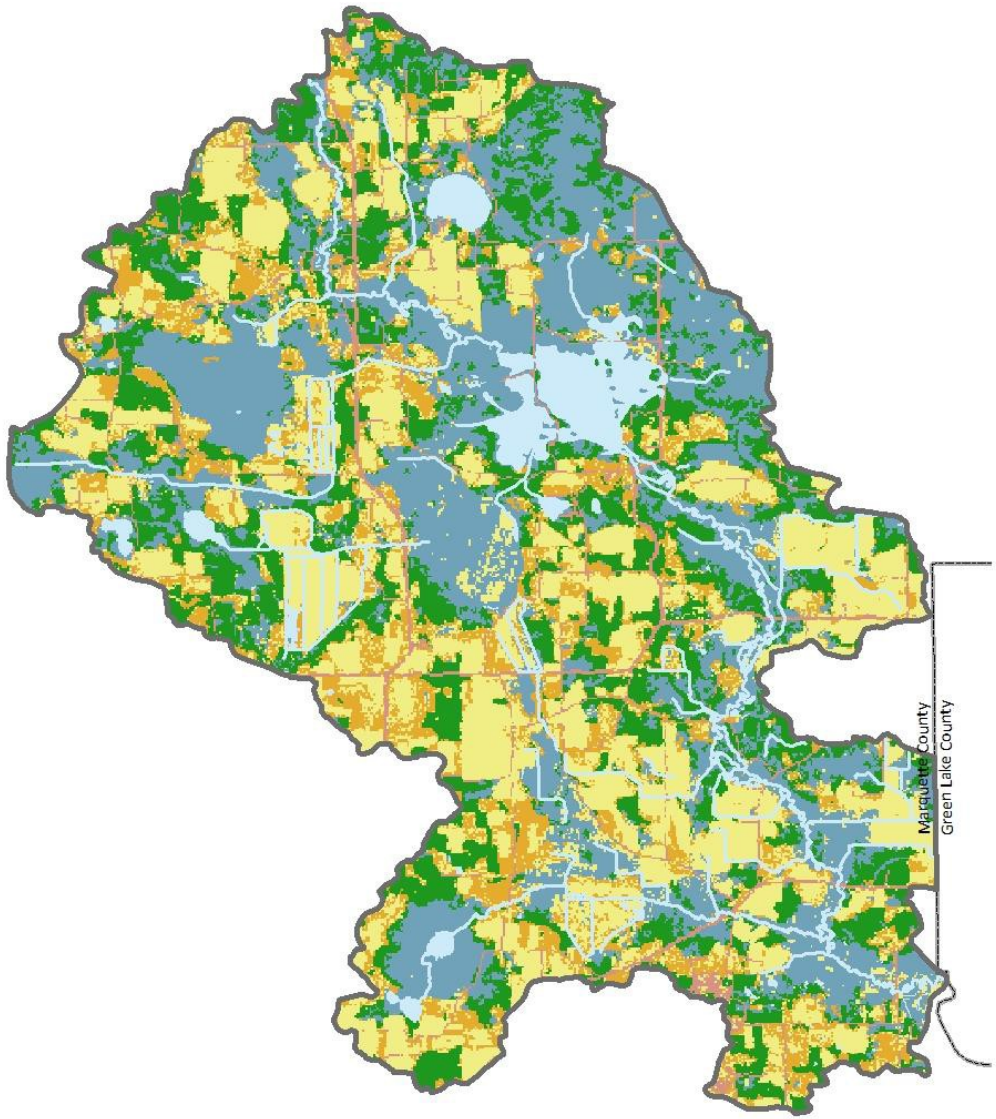


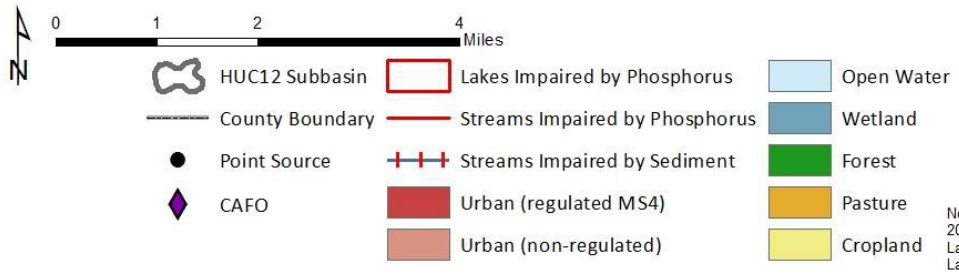




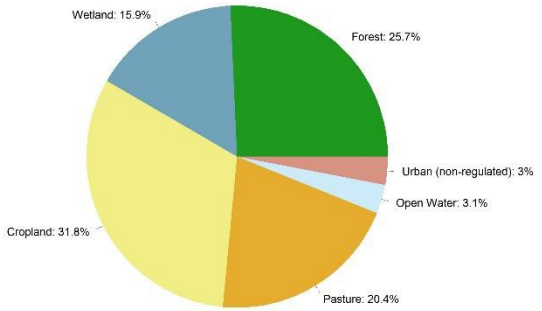
Appendix 19 HUC 12: 040302010704 – Mecan



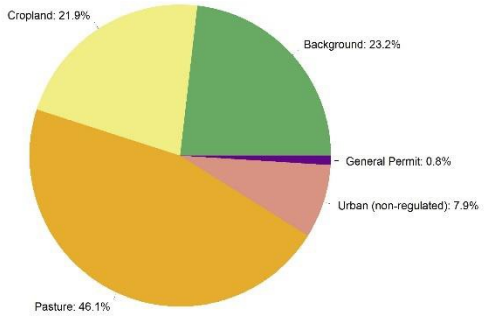




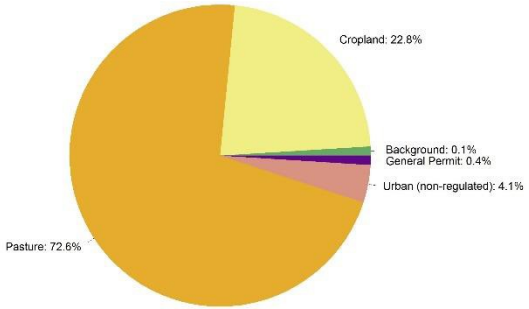
Land Use



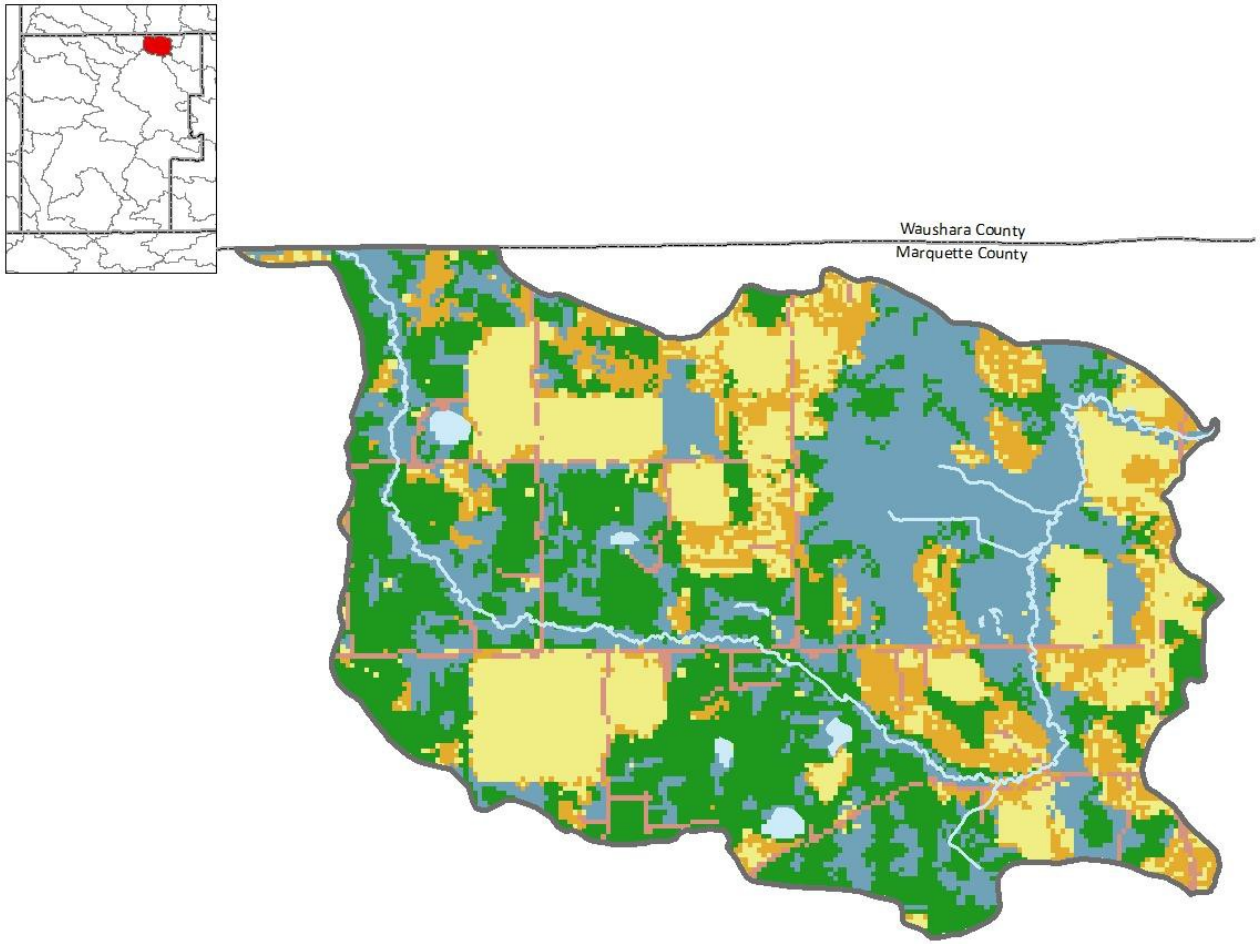
Baseline TP

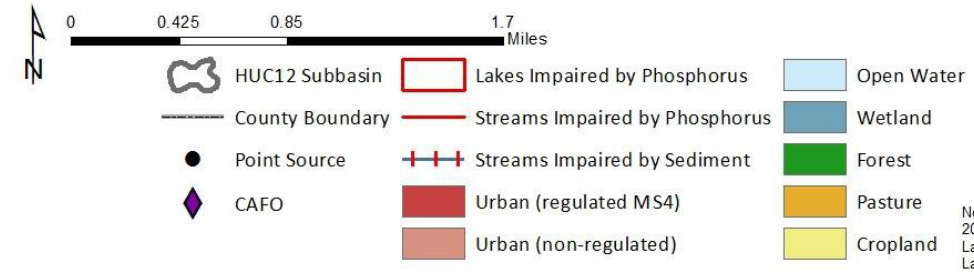


Baseline TSS

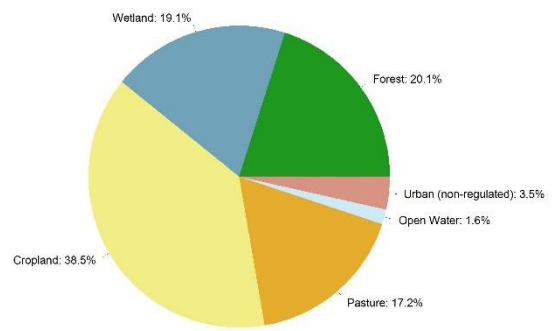


Appendix 20 HUC 12: 040302010803 – Lunch

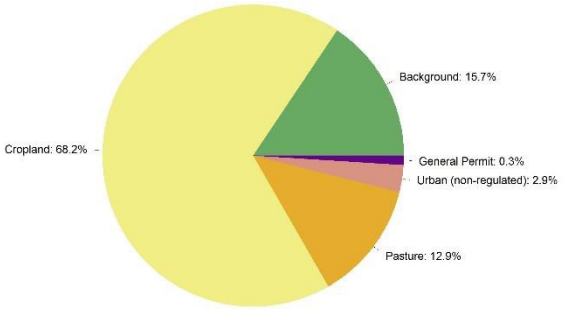




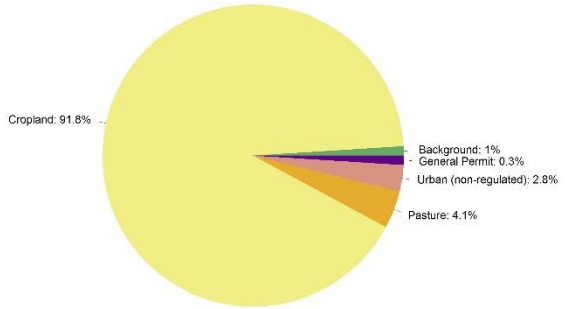
Land Use



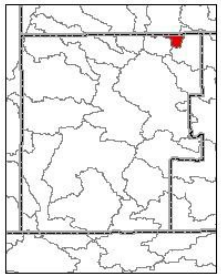
Baseline TP

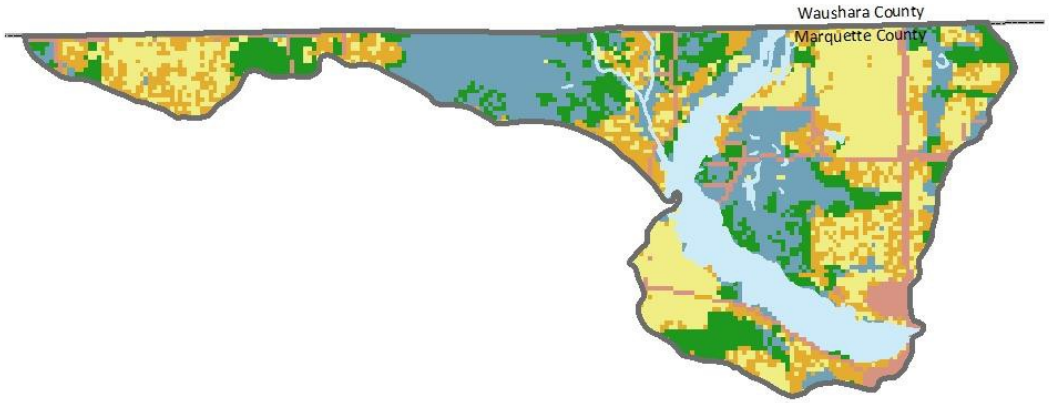


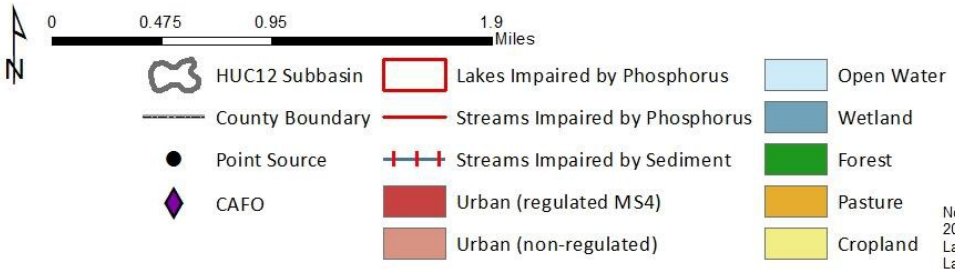
Baseline TSS



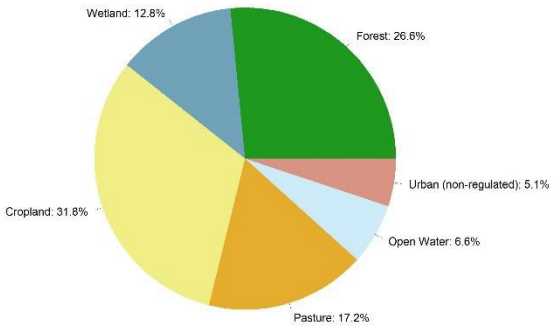
Appendix 21 HUC 12: 040302010804 – Little Lunch Creek-White River



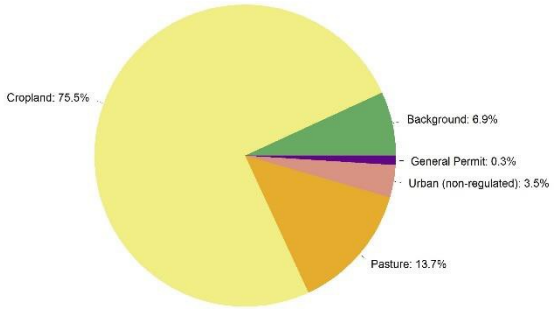




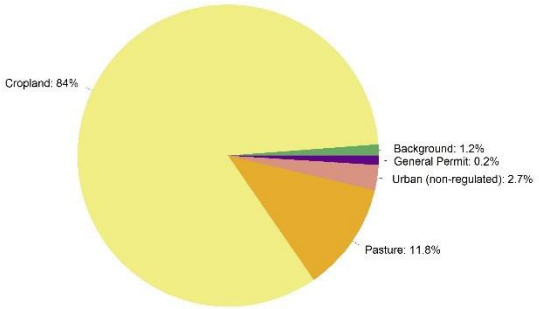
Land Use



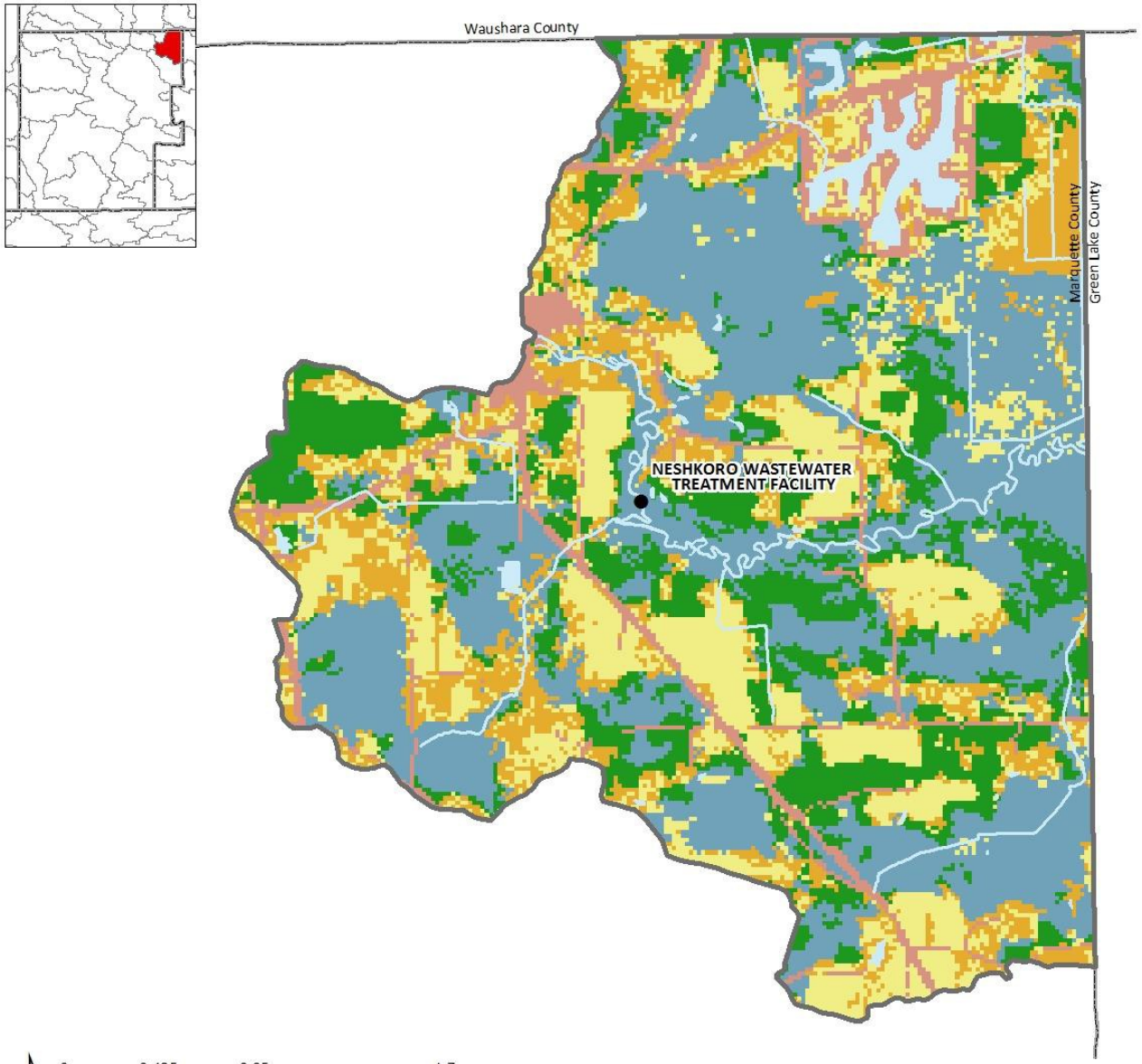
Baseline TP



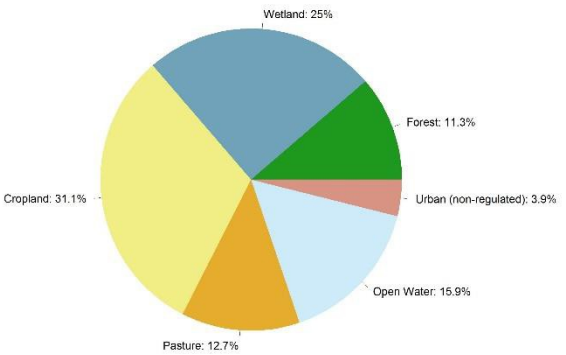
Baseline TSS



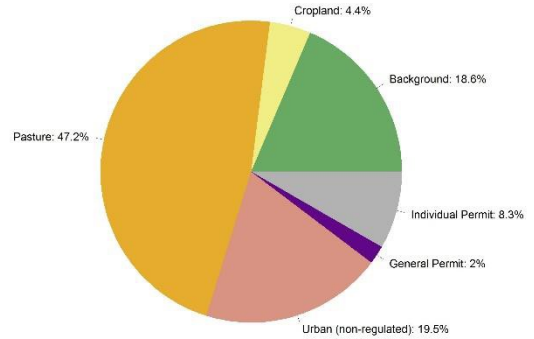
Appendix 22 HUC 12: 040302010806 – White



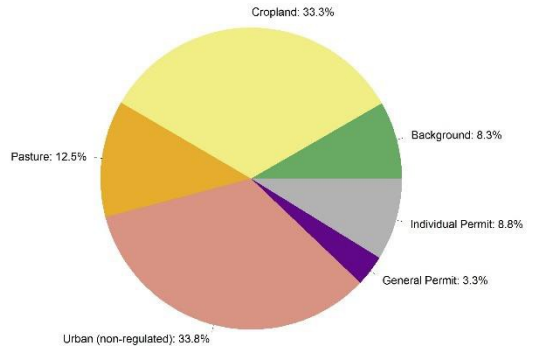
Land Use



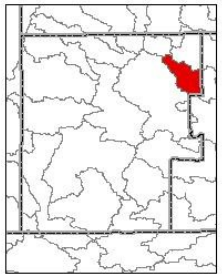
Baseline TP

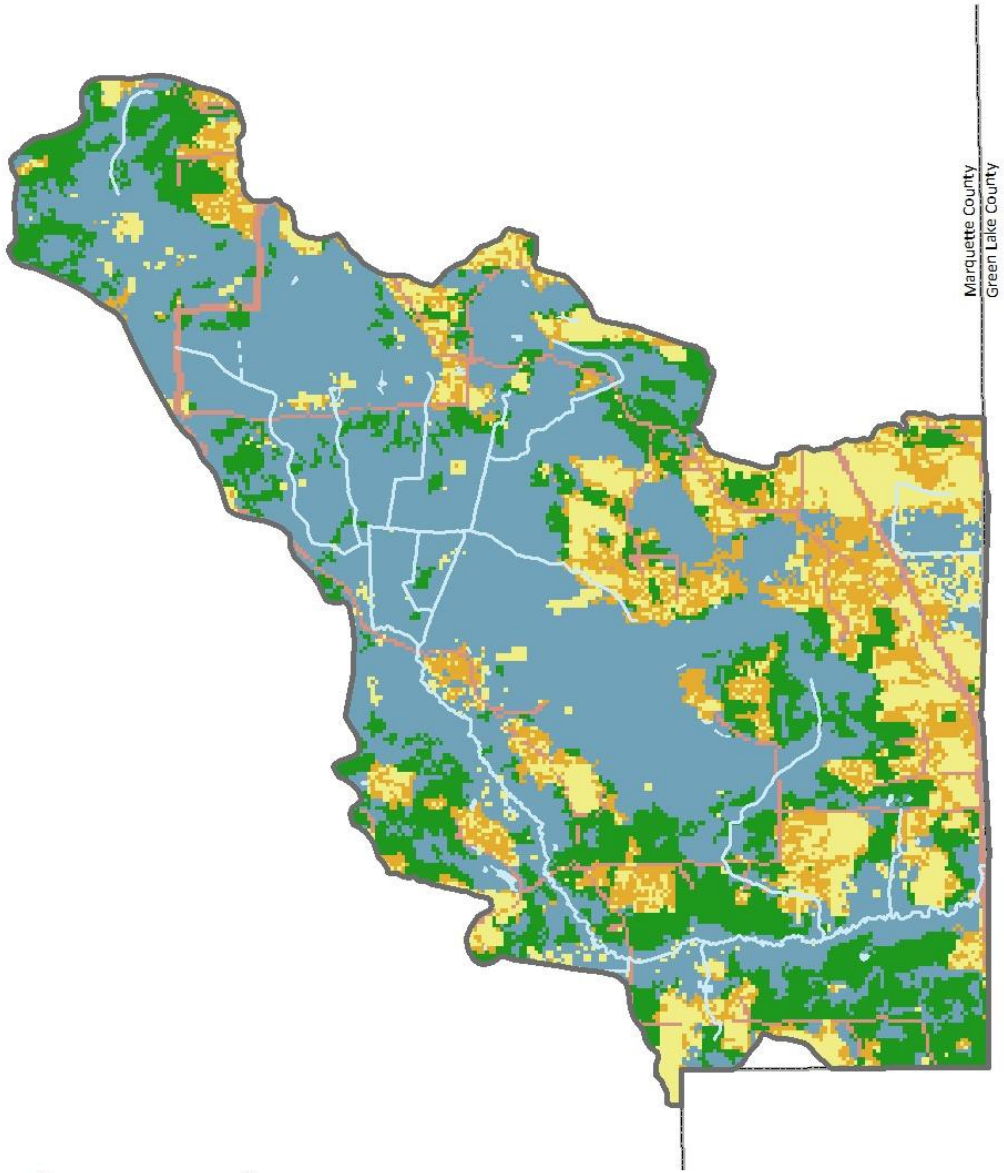


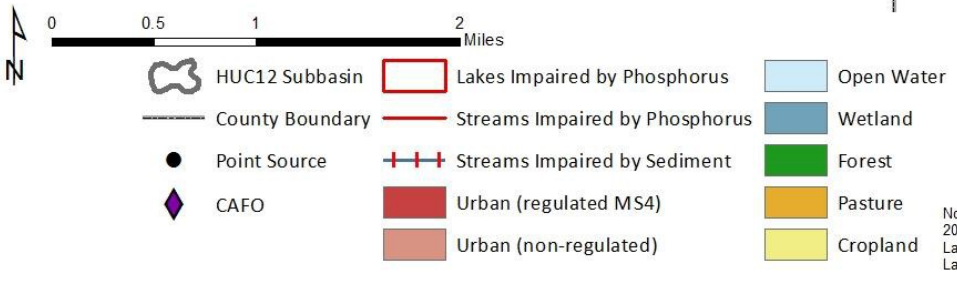
Baseline TSS



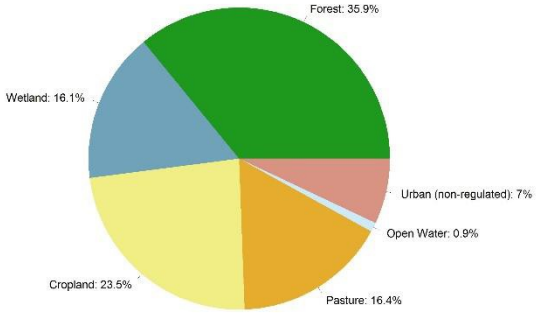
Appendix 23 HUC 12: 040302011101 – Black



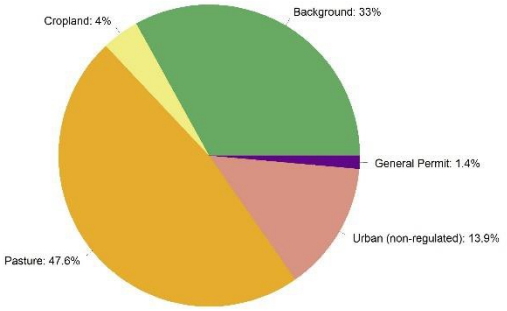




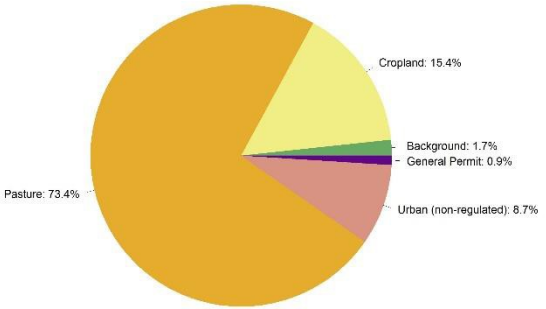
Land Use



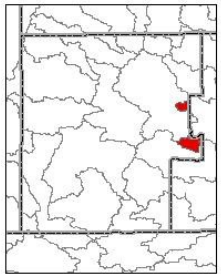
Baseline TP



Baseline TSS

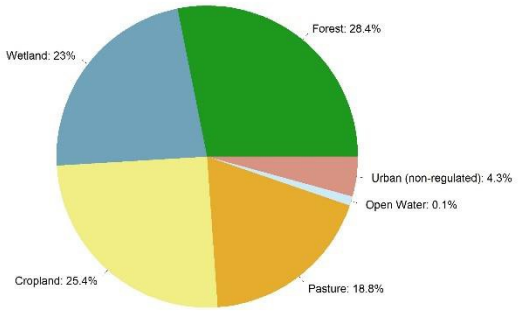


Appendix 24 HUC 12: 040302011102 – Mill Race-Fox River

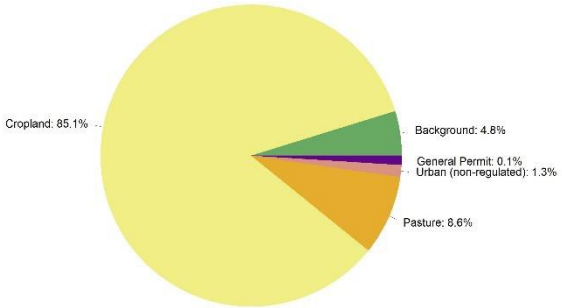


Note: Impairments are based on the 2018 303(d) Impaired Waters List (WDNR). Land Cover is based on the 2011 National Land Cover Database (USGS)

Land Use



Baseline TP



Baseline TSS