DANE COUNTY

LAND & WATER RESOURCE MANAGEMENT PLAN

2019 - 2028

DANE COUNTY LAND&WATER RESOURCES DEPARTMENT

COUNTY of DANE 1839 WISCONSIN

DANE COUNTY
LAND & WATER RESOURCE
MANAGEMENT PLAN

2019 – 2028

APPROVED BY THE WISCONSIN LAND & WATER CONSERVATION BOARD ON:
[Date]

APPROVED BY THE DANE COUNTY BOARD ON:
[Date]

APPROVED BY WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE & CONSUMER PROTECTION ON:
[Date]

DEVELOPED BY:
Dane County Land & Water Resources Department

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ACRONYMS

A value	Average Annual Soil Loss
AIS	Aquatic Invasive Species
CAFO	Concentrated Animal Feeding Operation
CARPC	Capital Area Regional Planning Commission
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
DATCP	Department of Agriculture, Trade and Consumer Protection (Wisconsin)
DNR	Department of Natural Resources (Wisconsin)
ECSM	Erosion Control and Stormwater Management
EPA	Environmental Protection Agency (United States)
EQIP	Environmental Quality Incentive Program
EVAAL	Erosion Vulnerability Assessment for Agricultural Lands
FPP	Farmland Preservation Program
FSA	Farm Service Agency (USDA)
GIS	Geographic Information System
HUC	Hydrologic Unit Code
K factor	Soil Erodibility Factor
LCC	Land Conservation Committee (Dane County)
LDMI	Low Disturbance Manure Injection
LWRD	Land & Water Resources Department (Dane County)
LWRMP	Land and Water Resource Management Plan
MAMSWaP	Madison Area Stormwater Partnership
NASS	National Agricultural Statistics Service (USDA)
NRCS	Natural Resource Conservation Service (USDA)
P	Phosphorus
POSP	Parks and Open Space Plan (Dane County)
RCPP	Regional Conservation Partnership Program (NRCS)
SLAMM	Source Loading and Management Model
SWAT	Soil & Water Assessment Tool
SWIMS	Surface Water Integrated Monitoring System
SWRM	Soil and Water Resource Management
T value	Tolerable Soil Loss
t/ac/yr	tons/acre/year
TMDL	Total Maximum Daily Load
TRM	Targeted Runoff Management (Wisconsin)
TSS	Total Suspended Solids
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UWEX	University of Wisconsin Extension
UWQG	Urban Water Quality Grants (Dane County)
WPDES	Wisconsin Pollutant Discharge Elimination System
Yahara CLEAN	Yahara Capital Lakes Environmental Assessment and Needs
Yahara WINS	Yahara Watershed Improvement Network

EXECUTIVE SUMMARY

Dane County Land & Water Resources Department has a long standing history of working to improve, enhance and protect the county's natural, historical and cultural resources through engaging individual landowners, businesses, non-profit organizations, other agencies, elected officials, and residents. The Dane County Land & Water Resource Management Plan is a locally led ten-year plan that sets goals and objectives to work toward the mission of the Department while maintaining eligibility for various grants.

Through the use of a local advisory committee and a public input process, the following goals were identified as important areas to work toward continuing to improve, enhance and protect the county's resources:

- **Goal I:** Assess, protect and improve surface water and groundwater resources
- **Goal II:** Maintain viable agricultural lands for long-term production
- **Goal III:** Develop, explore and implement innovative ideas
- **Goal IV:** Protect and enhance in-stream, riparian, wetland and upland habitats
- **Goal V:** Partner with and involve citizens on soil and water protection initiatives

Each of these goals has a series of objectives and actions to work towards over the next ten years. These goals, objectives and actions are reviewed annually and used as part of the annual work planning process for the Wisconsin Department of Agriculture Trade and Consumer Protection. These goals, objectives and actions are also used as supporting information for many of the grants the Department pursues.

This plan also incorporates and references many existing resource assessment documents and action plans that have been developed in the county. Many of the goals and objectives of these other plans overlap and complement the land and water resource management goals identified in this plan.

Through diligent, thoughtful and targeted efforts, locally-led implementation of soil and water conservation as well as improvement and protection of natural, historical and cultural resources will continue to be a priority for the citizens of Dane County.

CHAPTER 1: INTRODUCTION

Locally led strategies have long-served as a blueprint for addressing local needs, concerns, goals, implementation, monitoring and reporting. Historically, Wisconsin's soil and water conservation programs have relied on locally driven plans to implement ideas, programs and strategies to improve, protect and enhance the natural resources in the state bringing together a variety of partners and stakeholders.

Through Wisconsin Act 27 (1997 – 1999 Biennial Budget Bill), Chapter 92.10, Wisconsin Statutes, was amended creating a county land and water resource management planning program. The impetus behind the program was to develop a locally-led process that protects Wisconsin's land and water resources by streamlining administrative and delivery mechanisms, improving decision-making and making better use of local, state and federal funds.

WHAT IS A LAND & WATER RESOURCE MANAGEMENT PLAN?

A land and water resource management plan (LWRMP) is a long-term strategic plan that includes an assessment of the resource conditions and needs of a county. The process includes input from local citizens as well as resource professionals and directs conservation efforts. While the plan is a 10 year document, it is used in the development of annual work plans and provides supporting materials for the application for conservation grant funds. The process and plan is a holistic approach to land and water resource management that focuses on partnerships and collaboration. At a minimum, a land and water resource management plan is required to address the following items:

- Water quality and soil erosion conditions,
- State and local regulations used for implementation including compliance procedures,
- Water quality objectives,
- Key water quality and soil erosion problem areas,
- Conservation practices to address resource concerns,
- Process to identify priority farms,
- Strategies to encourage voluntary implementation of conservation practices,
- Information and education,
- Coordination with partners including local, state and federal agencies,
- Multi-year work plan to implement conservation practices and achieve compliance with performance standards,
- Includes benchmarks for progress and performance towards plan goals and objectives, and
- Estimated costs needed to implement the plan including staffing and cost-share funding.

DANE COUNTY LAND & WATER RESOURCES DEPARTMENT

Recognizing the importance of cross program coordination, the Dane County Land & Water Resources Department (LWRD) was created as part of the 2005 Dane County budget. Effective January 1, 2005, the Parks Department, Land Conservation Department and Lakes & Watersheds Division of the County Executive's Office were merged into one department. The LWRD provides a wide range of services to meet the vision and mission of the department including: permitting, planning, technical services, communication and outreach, lake management, invasive species management, and other services. The department has four oversight committees and commissions made up of county board supervisors and appointed representatives:

- Environmental, Agriculture and Natural Resources Committee,
- Land Conservation Committee,
- Parks Commission, and

- Lakes and Watersheds Commission.

VISION & MISSION

Dane County citizens value the quality of the county's natural, historical and cultural resources as well as recognize the connection between these resources and their own quality of life and expect these resources to be improved and sustained for present and future generations. As such, the LWRD exists:

- To ensure the protection and enhancement of Dane County's natural, historical and cultural resources;
- To provide the County's citizens with a broad array of accessible, high quality resource-based recreational services and facilities; and
- To support citizens, communities, local governments and other agencies and organizations in their resource management and protection activities.

The LWRD pursues its mission alone and in collaboration with other agencies and organizations, through a mix of strategies that includes and combines resource management, program delivery, education and outreach, policy development, oversight, data management, technical assistance, responsiveness and excellent customer service.

PREVIOUS LAND & WATER RESOURCE MANAGEMENT PLANS

There have been three previous Dane County LWRMPs that have been updated through the years. Previous plans were five-year implementation plans that included thorough work plans that identified and anticipated resource needs for the life of the plan. The first plan was developed and approved in 1999. The second plan updated the first plan and was approved in 2003. These plans were developed prior to the LWRD merger in 2005. The 2008 plan took information from the previous two plans and updated it to reflect the new vision and mission of the merged LWRD.

In 2013, when it is was time to update the 2008 plan, Department of Agriculture, Trade and Consumer Protection (DATCP) modified the LWRMP process and began to transition county LWRMPs from five year plans to 10 year plans. As such, the 2008 plan was updated to address some of the new requirements for a 10 year plan and received a five-year extension. This extension expires December 31, 2018. As such, for 2018, this plan update is the first official 10 year LWRMP for Dane County.

Dane County's LWRMP is intended to complement and coordinate with existing plans rather than replace them. It is an action and implementation plan that emphasizes cooperating with conservation partners. Through continued cooperation between the LWRD and partners along with stable funding, citizens will be able to continue to enjoy Dane County's soil and water resources today and well into the future.

REVISION & UPDATE PROCESS

Throughout the year-long process, LWRD staff worked with staff at Department of Natural Resources (DNR) and DATCP on reviewing and updating the resource assessment sections of the LWRMP, interpreting new data, identifying trends, targeting resource concerns or geographic areas, and incorporating other recommended components or program requirements. Included in the resource assessment process is a review of existing resources versus new resources needed to accomplish the goals, objectives and actions identified in the plan. These resources may include staffing, funding, partnerships, collaboration, data, monitoring, equipment and other resources. LWRD staff also reviewed existing department, county or regional documents, reports and plans that have been developed since the last LWRMP update to incorporate or cross reference applicable information. These resources are referenced throughout the plan as appropriate.

PUBLIC COMMENT & APPROVAL PROCESS

Once the draft plan was completed, it was submitted to DNR and DATCP for review on October 5, 2018. The two agencies provide comments to the county which were incorporated into the final draft. In addition, the draft plan was presented to the Land Conservation Committee (LCC) to move to public comment on September 25, 2018. The LCC held a public hearing for the LWRMP on November 15, 2018. Comments received from the public hearing were incorporated as necessary into the final draft. The final draft of the plan was presented to and approved by the County Board on DATE. Finally, the plan was presented to the state Land and Water Conservation Board on December 4, 2018. The Land and Water Conservation Board recommended approval of the plan at this meeting and the final plan was approved by DATCP on DATE.

APPROVED PLAN

This plan is set to expire December 31, 2028. However, after five years of implementation, LWRD staff return to the county LCC and state Land & Water Conservation Board to present on progress and address any course corrections, new initiatives, or other changes needed to implement the remaining five years of the plan before the next update. In addition, the goals, objectives and actions identified in this plan are used over the next ten years to develop annual work plans in accordance with DATCP templates.

SUMMARY

Locally led implementation is an important mechanism to address local resource concerns and priorities. Dane County LWRD anticipates this plan to be a guiding document for the next ten years in identifying annual work priorities as well as supporting information for future grant applications, programming, partnerships and collaboration.

CHAPTER 2: LAND USE & TRENDS

Changes in land use in the county help inform priorities and management options. It is important to understand past trends and future projections to gauge how they may impact the implementation of soil and water conservation programming throughout the county.

POPULATION & LAND USE

Dane County contains the second largest metropolitan area in Wisconsin and the seat of state government. Rapid growth has been the norm throughout the county over the past three decades. According to the Wisconsin Department of Administration, Dane County had an estimated population of 524,787 in 2017, a 7.5% increase from 2010. This represents 9.1% of the total population in the State of Wisconsin. The county is expecting at least an additional 15% increase by the year 2040. As the population continues to grow, more emphasis will need to be placed on protecting the natural resources. Land use is still predominantly agricultural; however, more farms are being lost as development continues to encroach into rural Dane County. Figure 1 is a map with 2015 land use data Table 1 displays the acres and percent change in acres by land use category for 2005 and 2015 data.

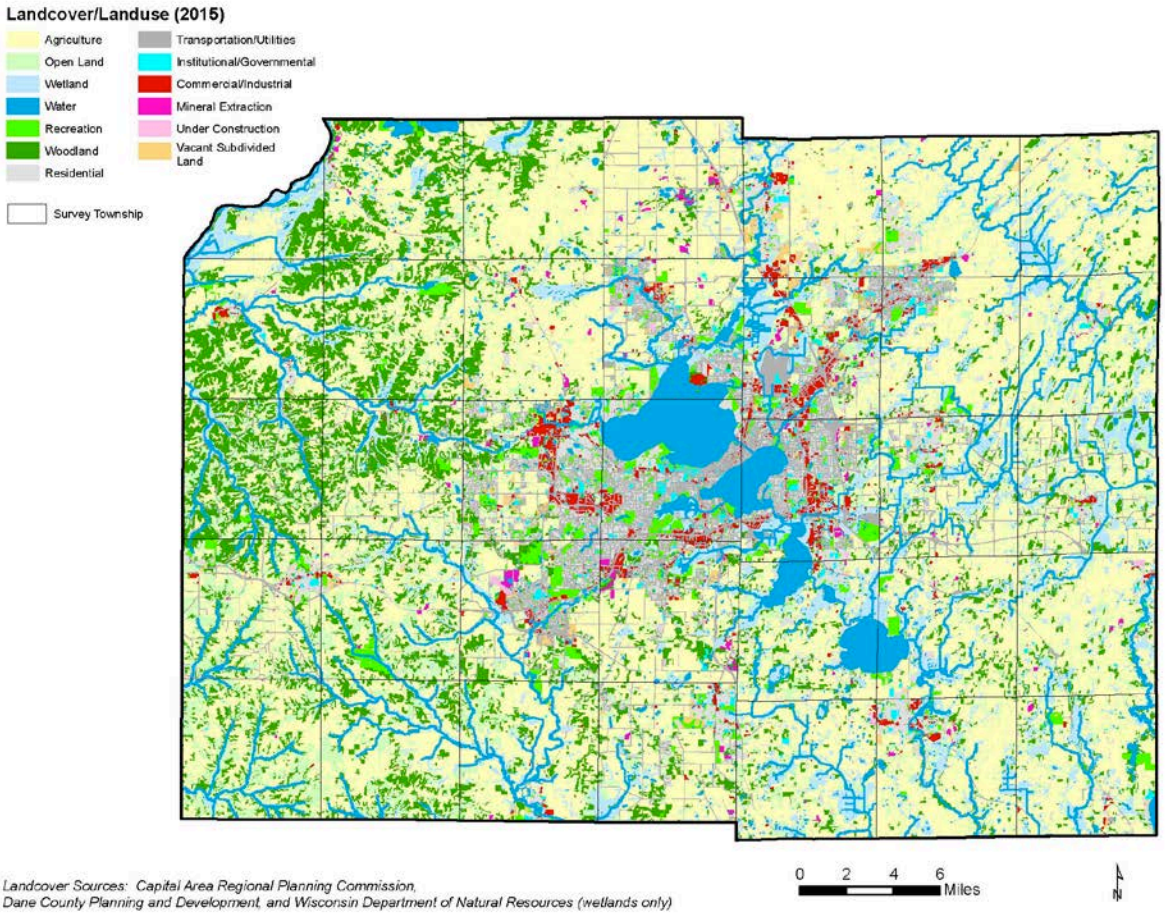


Figure 1: Land Use Map

Table 1: Land Use Summary, 2005 & 2015

Land Use Category	Acres (2005)	Acres (2015)	% Total	% Change
Residential	56,552	59,548	7.5%	5.3%
Industrial	7,682	6,775	0.9%	-11.8%
Transportation	46,075	48,152	6.1%	4.5%
Communications & Utilities	1,249	2,271	0.3%	81.8%
Commercial	7,387	8,797	1.1%	19.1%
Institution & Government	5,544	5,203	0.7%	-6.2%
Recreation	15,835	26,207	3.3%	65.5%
Agriculture & Undeveloped	651,643	635,047	80.2%	-2.5%
Total Developed Area	140,324	156,953	19.8%	11.9%
Total Area	791,967	792,000	100.0%	0.0%

Source: CARPC

AGRICULTURAL TRENDS

Agriculture is the predominant land use within the county occupying roughly 505,420 acres. In addition to the abundance of agriculture, there is also a tremendous amount of diversity in the types and sizes of agricultural operations. Some examples include, large and small scale rotational grazing operations, concentrated animal feeding operations (CAFO), vegetable and specialty crop grows, and large and small scale cash crop producers. In looking at the farm operation data from the United States Department of Agriculture (USDA) – National Agricultural Statistics Service (NASS) from 2006 to 2012 the number of farm operations increased from 2,595 to 2,749 (Table 10, Appendix A). However, the acres of land in farm operations decreased from 512,971 to 505,420. Based on data from USDA – NASS, the county is losing approximately 2,500 acres of cropland annually (Figure 26, Appendix A). This increase in farm operations and decrease in acres results in an average of 183 acres per farm operation.

Harvested crop data from the 2006 and 2016 USDA – NASS (Table 11, Appendix A) show a large increase in both the acres of corn grain and corn silage harvested 12% and 59% respectively. Wheat also had a 14% increase in harvested acres. This is in contrast to oats and alfalfa which had a 75% and 65% decrease in harvested acres respectfully. Soybean acres harvested stayed relatively unchanged between 2006 and 2016.

The total number of cattle and calves in the county also increased from 130,000 to 135,000 when comparing 2006 to 2016 data from USDA – NASS. The number of dairy cows increased by more than 12% from 49,000 to 55,000. The total number of dairy herds decreased from 390 to 251. Average number of dairy cows per herd increased by more than 75% from 125 to 219. Figures 27 and 28 in Appendix A show the current trends.

URBAN TRENDS

While the land use in Dane County is predominantly in agriculture, urban areas also make up a growing portion of the county. There are 33 townships, 20 villages and eight cities wholly or partially located within the county. Figure 2 shows the location of the municipalities within the county.

Reviewing land use trends indicates there is a decrease in agricultural land in the county while showing increases in residential, commercial and transportation land uses. This growth in urban land uses correlates with the population growth trends in the county as well. This increase in growth is evident in the permitting numbers for erosion control and storm water management (ECSM) permits processed by the county as well as the number of inspections completed in Table 12 (Appendix A). Figure 29 (Appendix A) shows that on average, plan reviews are increasing annually by about 20 plans and permits are increasing by about 13 per year.

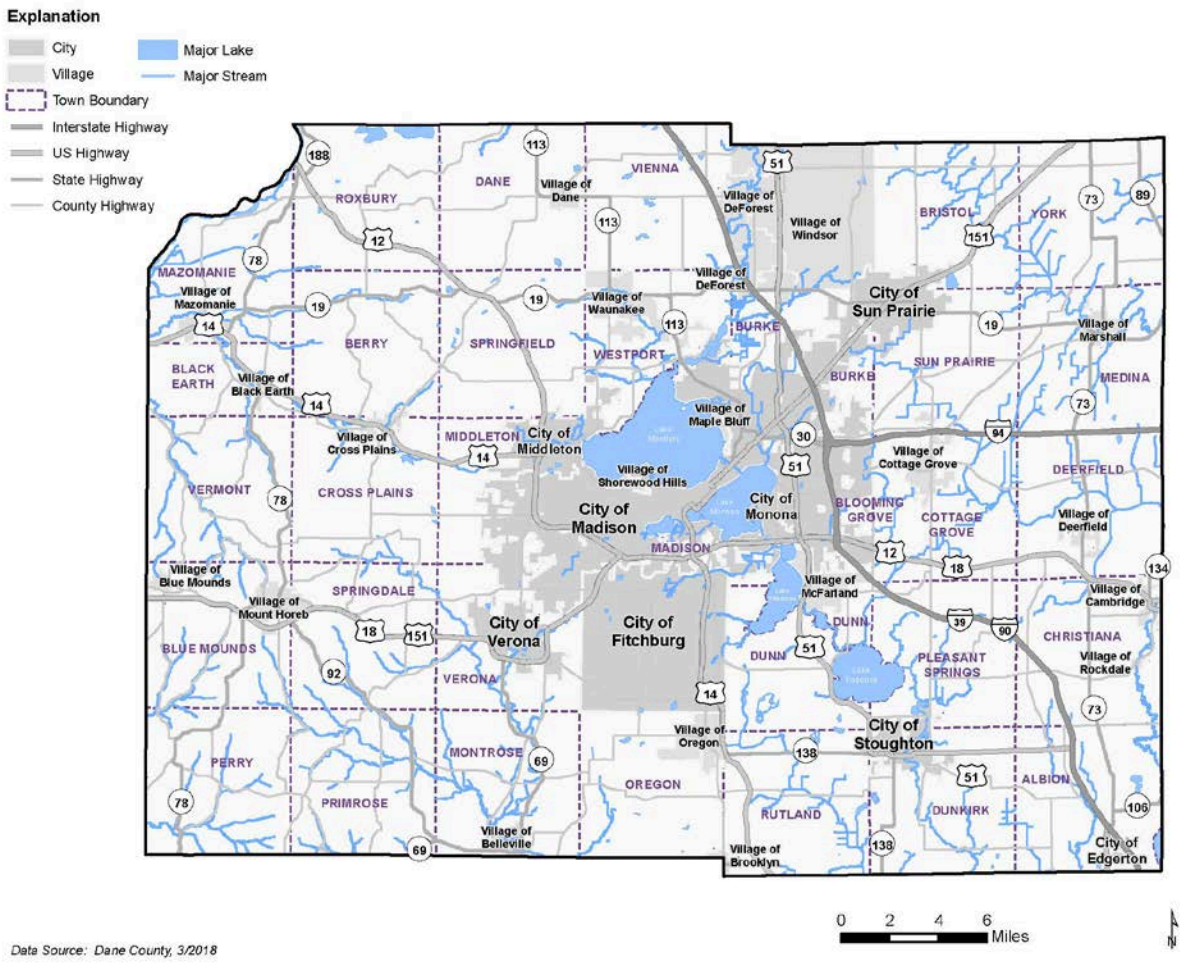


Figure 2: Municipalities in Dane County

RECREATIONAL TRENDS

Dane County provides a variety of opportunities to get out and recreate throughout the county. With over 435 miles of streams and rivers, 68 lakes, wildlife and natural areas, parks, bike trails, etc., these areas play an important role for the quality of life for residents and visitors to the county; making protecting, improving and enhancing these resources important.

WATER RECREATION

University of Wisconsin – River Falls conducted three surveys on water recreation in Dane County between 2010 and 2013. The purpose of these surveys was to determine how Dane County residents are utilizing the recreational water resources available to them, examine the geographic dispersion of Dane County water resource users, and to quantify the economic impact that a subset of water-recreation activities have on the Dane County economy. Nearly 60% of survey respondents said they participate in activities near Dane County waters (includes running and walking). 65% of lake users surveyed were from Dane County while 35% were from outside the county. When interviewed about their primary activity on the lakes, 33% were fishing from a boat, 25% were kayaking or canoeing, 15% were motor-boating, 13% were fishing from the shore, 4% were sailing, and 8% were participating in other activities, including water skiing, activities near water, jet skiing, rowing, swimming, and ice fishing. When interviewed about why they chose Dane County waters, the top reasons were proximity

(48%) and quality of water (31%). The study also looked at the economic impact of motor-boats and fishing from a boat and found that it adds $40 million yearly to Dane County's Economy and creates or sustains nearly 800 jobs.

PARKS & OPEN SPACES

Dane County has some of the finest and most diverse natural resources in Wisconsin. The Dane County Parks system currently provides 12,608 acres of land in recreation parks, wildlife areas, natural resource areas, the Ice Age Trail corridor, forests, and historical/cultural sites. Dane County Parks and Open Space Plan (POSP) is a countywide comprehensive outdoor recreation and natural resource plan that is updated every five years. This plan seeks to identify significant cultural, historical, and natural resources that should be considered for possible protection, preservation, or restoration and also seeks to identify countywide recreation needs and Dane County's role in providing accessible, equitable, and inclusive facilities to meet anticipated demands. The plan was last updated in 2018. Resource and recreation needs were identified through a comprehensive public input process which included community meetings and over 1,100 survey responses. A few key results from public input survey indicated that:

- Walking, hiking and running continue to have highest recreation participation rates both locally and nationally. This is consistent with an overall aging population dynamic and complements Dane County's continuing commitment to prioritize trail development.
- Demand for mountain biking and disc golf continues to rise.
- Biking, dog parks, disc golf, paddling, picnicking, fishing, and driving for pleasure continue to show strong participation rates in Dane County.
- Regional scale special events and sporting events continue to add extra demands on campgrounds and open utility spaces.
- Food, exercise, and education should be included in outdoor recreation planning considerations for new facilities and programs over the next five years, especially for minority populations.

SUMMARY

Overall, the county is seeing significant changes in and patterns between rural and urban spaces. Trends in agriculture, which is the predominate land use in the rural portions of the county, continue to show decreases in the number of farms and animals but increases in the herd sizes, milk production and corn and soybean production. From the urban side, population trends and urban growth continue to be some of the fastest in the state. These trends continue to reflect a rural/urban dichotomy in the county.

CHAPTER 3: LAND & WATER RESOURCES

It is important to understand the current state of the land and water resources of Dane County before the goals and objectives of this plan are presented. The geography of the region has a profound influence on the natural resources throughout the county. The following provides a brief overview of the physical characteristics of Dane County.

PHYSIOGRAPHY

At 1,230 square miles (or 793,335 acres) in size, Dane County is the third largest county in Wisconsin after Marathon and Grant. The geomorphology of Dane County is a result of glaciation, the Yahara River, and the Wisconsin River. The eastern half of Dane County is glaciated, while the western half of the county lies within the Driftless Area. Eastern Dane County is characterized by low rolling hills with intermittent moraines. Western Dane County has the greatest relief and is comprised of ridgetops, steep sloping valleys, rock outcroppings, and narrow valley bottoms. Figure 3 is a shaded relief map of the county depicting the glaciated and unglaciated regions as well.

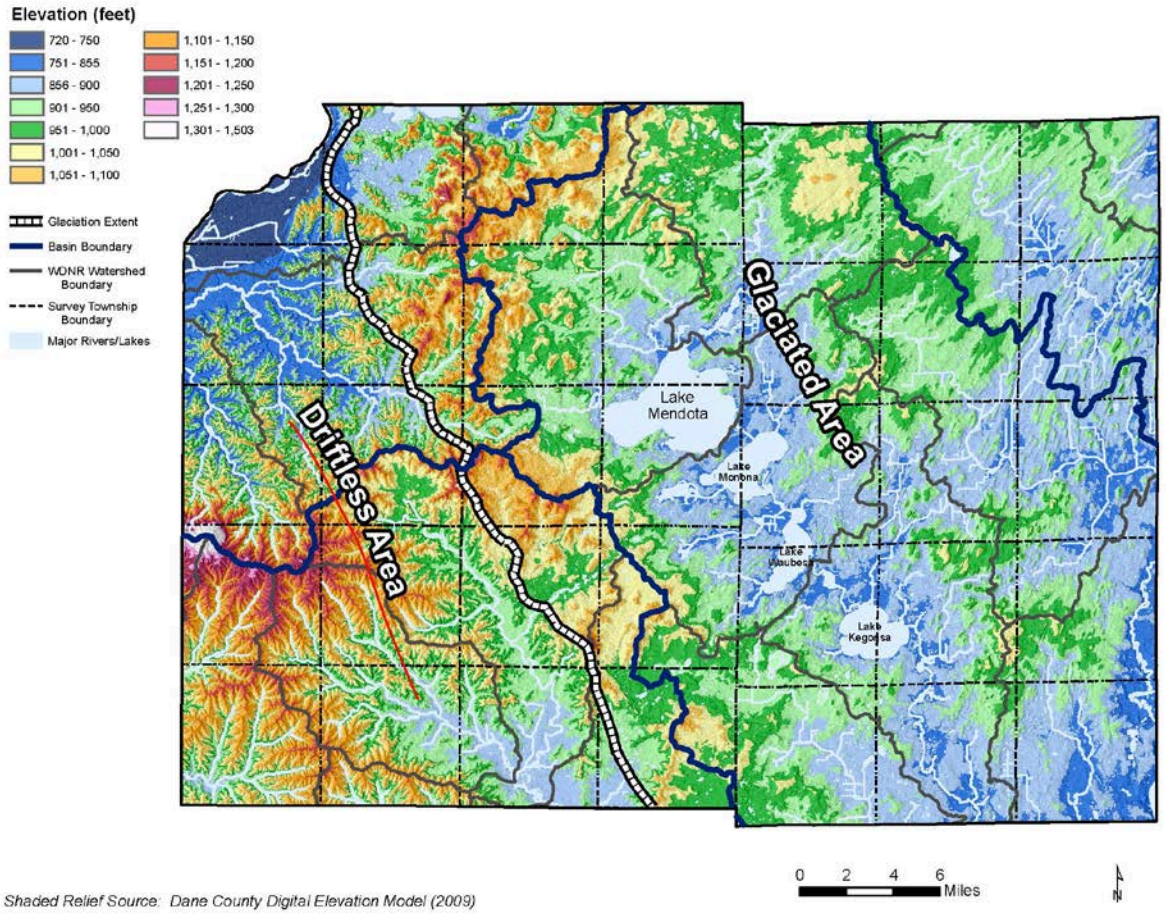


Figure 3: Shaded Relief Map, Dane County

SOILS

The soils throughout Dane County vary depending on whether the area was glaciated or not. On the ridge tops of the Driftless Area, the soils formed from a thin layer of loess and the underlying residuum of Paleozoic rock. Soils on the side slopes formed in colluviums that resulted from mass-wasting and fluvial erosion. Steep slopes and shallow depth to bedrock are the primary soil properties that affect use and management of soils in the Driftless Area.

Most of the glaciated portions of Dane County are composed of sediment associated with the Horicon Member of the Holy Hill Formation. The soils formed from loess as well as the underlying sandy loam till, sand and gravel outwash, and stratified silt and clayey lacustrine deposits. There are also areas of hydric soils, comprised of both organic material and mineral sediments that constitute existing and former wetlands. In the Wisconsin River bottomland, the soils formed in the sandy sediment deposited by glacial melt water. Erosion and sedimentation affecting water quality and long-term soil productivity are the major management concerns in the glaciated areas of the county.

Figure 4 shows the land evaluation ratings for soils in Dane County based on prime farmland, land capability class, and corn and alfalfa productivity.

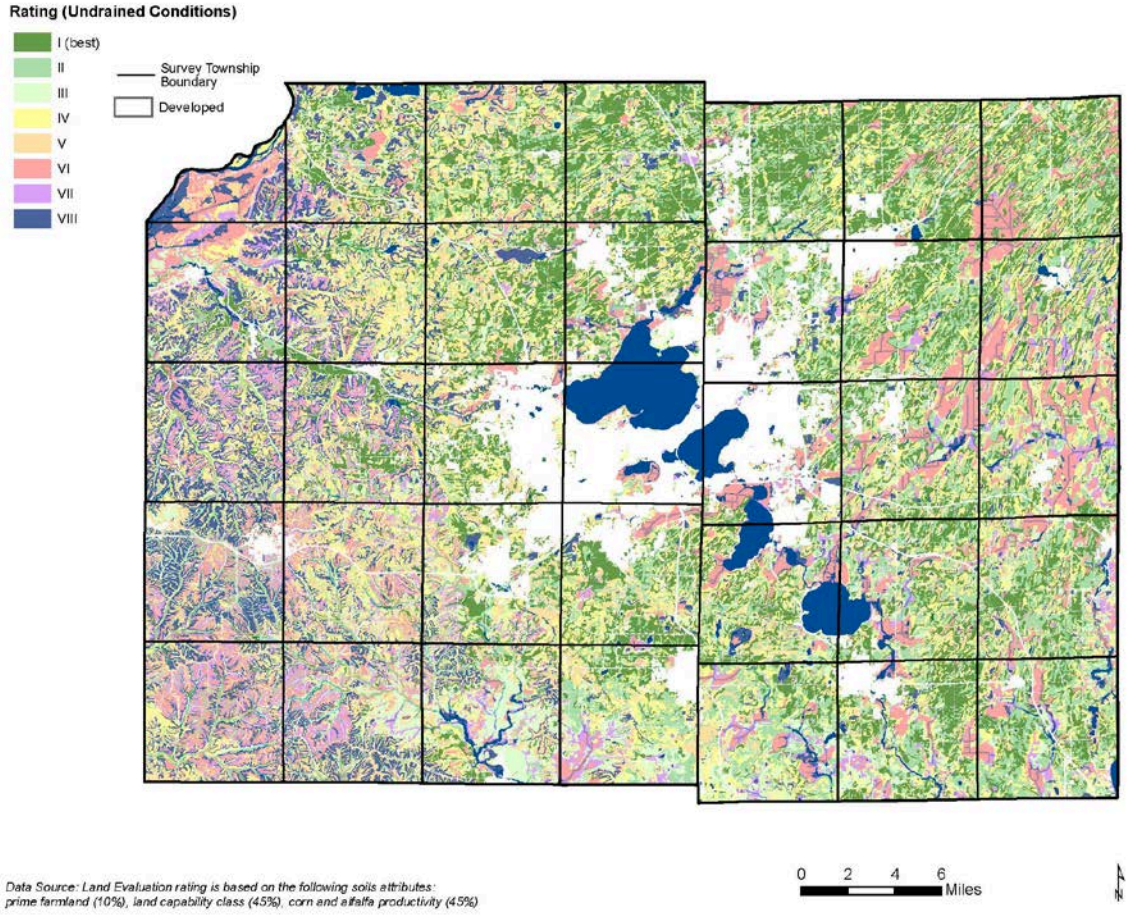


Figure 4: Soils, Dane County

SURFACE WATER

The county is home to 68 named lakes and ponds covering 33 square miles and 52 named streams and rivers extending 435 miles. The total surface water acreage in Dane County is 26,748 acres, or 36 square miles. Dane County's distinct

geomorphologies create different effects on water patterns and resources. The dividing line between the two geomorphologies is roughly the watershed boundary between the Lower Rock River basin and the Lower Wisconsin and Sugar-Pecatonica basins (see Figure 3). Figure 5 shows the location of the major waterbodies in the county.

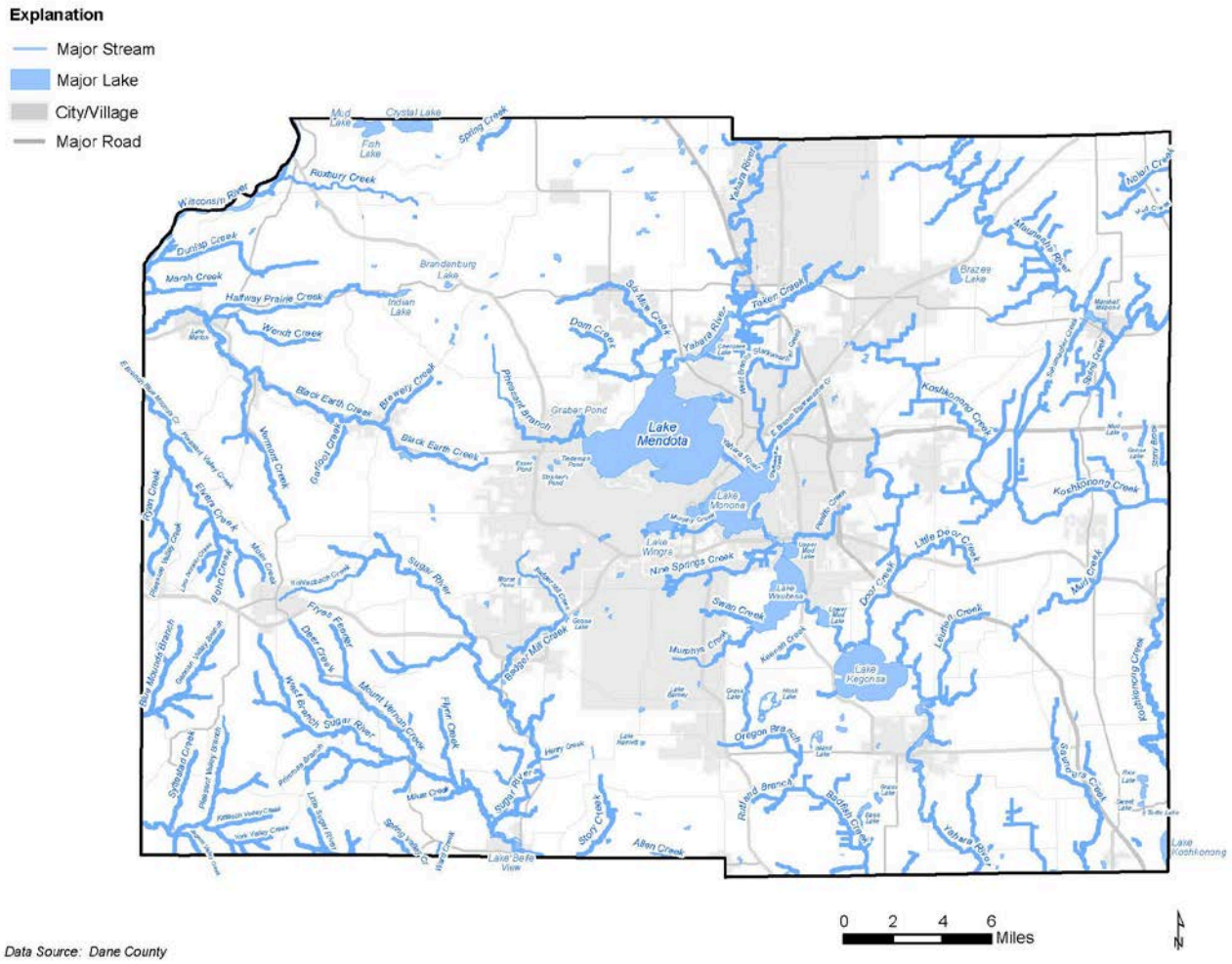


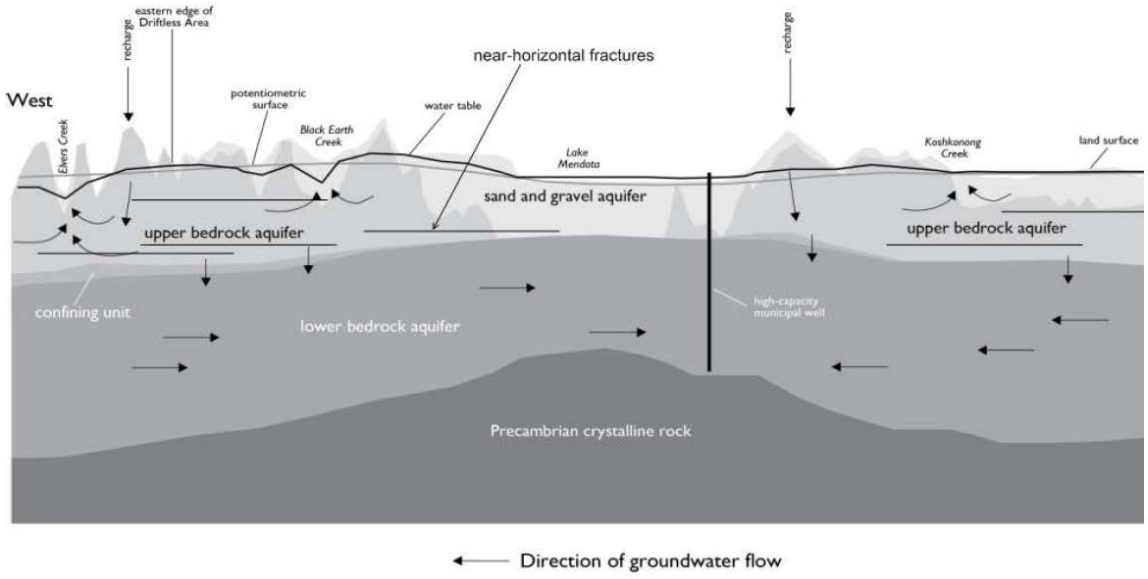
Figure 5: Major Hydrology

In the eastern glaciated portion, streams are low gradient and are usually adjoined by wetlands. Few streams are spring fed, and drainage is not well defined. Sediments of sand, silt, and muck underlie the streams. In the Yahara River valley area (Rock River basins), deep glacial deposits dammed up large valleys to form a chain of lakes and wetlands (now known as Mendota, Monona, Waubesa, and Kegonsa), all of which are connected by the Yahara River.

In the western, unglaciated portion of the county, many streams have a gravel or rubble bottom. The steeper topography in the western portion of the county results in higher flow rates than the streams in the eastern glaciated portion. Most streams are nourished by springs and seeps that flow from water-bearing layers of bedrock exposed on hillsides and from upwelling groundwater discharge. The upwelling of groundwater and steep gradients contribute to cool water and high dissolved oxygen, resulting in abundant trout streams in this half of the county. This area is generally without natural lakes or impoundments. The Wisconsin River Valley in the northwestern part of the county contains deep sand and gravel deposits and extensive marshes in the river floodplains. Fish and Crystal Lakes are located here.

GROUNDWATER

In Dane County, groundwater is the source of all public and domestic water supplies making it a critical water resource to protect. There are three main aquifers where water is pumped from to service the county: (1) shallow, unlithified aquifer made up of clayey lake sediment, sand and gravel; (2) upper bedrock aquifer made up of sandstone, siltstone, and dolomite; and (3) Mt. Simon aquifer made up of standstones which is the primary source of water for high-capacity wells. Figure 6 shows the general location of the three main aquifers in the county. Recharge for these aquifers comes primarily from rainfall and snowmelt in the county or just outside of the county. As impervious surfaces increase throughout the county and more water is used, recharge decreases and groundwater withdrawls increase. In general, the quality of the water is good with uniform composition between all three aquifers with the main issue hard water due to high concentrations of calcium, magnesium and bicarbonate. While water quality is generally good, there are some concerns regarding nitrates, bacteria, pesticides, chlorides and volatile ordinance chemicals as a result of land use trends and practices over time. Sources of groundwater contaminants may include: fertilizer use, manure applications, on-site septic systems, and herbicide/pesticide use. With over 12,000 private wells and numerous public wells, groundwater quantity and quality are important to the vitality of the county.



Source: McDonald, Cory P. et al., 2015

Figure 6: Groundwater Aquifer System

WETLAND RESOURCES

Wetlands are an integral part of a viable and diverse natural resource system. Wetlands reduce the rate and volume of storm water runoff, provide protection from flooding, filter water and remove pollutants, and provide important wildlife habitat and natural corridors for wildlife movement and scenic beauty. Over half of the wetlands in Dane County have been lost over the last century. Many of those that remain have been degraded. The primary disturbance to wetlands has been through artificial ditching, draining, and filling. In rural areas, ditching and buried drain tiles remove water close to the ground surface so the land can be cultivated. This alters the hydrology of the wetland, causing significant long-term negative impacts. Filling for urban development has also reduced the overall extent of wetland acreage and fragmented many large wetland areas. Currently, 66,000 acres, or 8.2%, of the land area in the county is wetlands as shown in Figure 7.

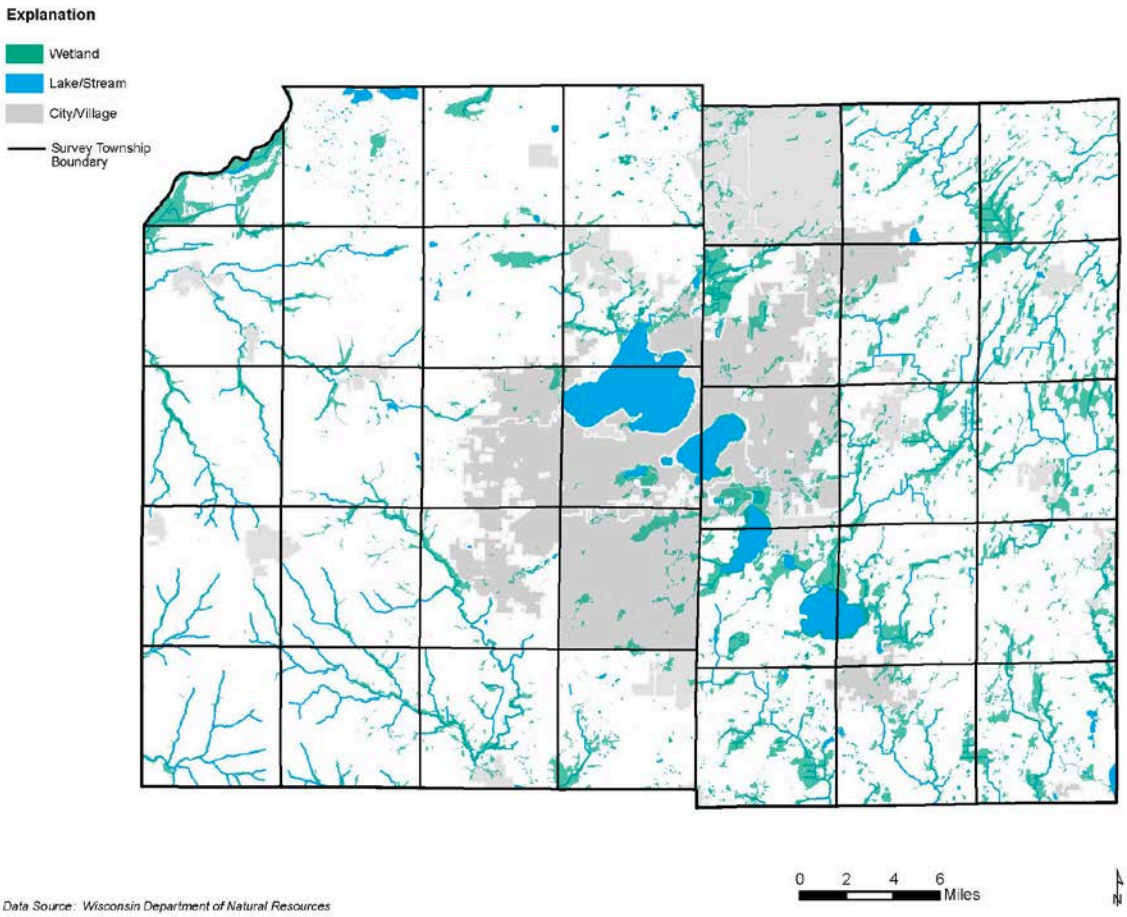


Figure 7: Wetlands, Dane County

WOODLAND RESOURCES

Approximately 91,832 acres, or 11.5%, of the total land area of the county is currently classified as woodlands. LWRD provides limited services for private forest landowners and relies on state and federal partners to provide assistance to those landowners. However, the county does manage a lot of forestry activities on Dane County park properties.

The county owns and manages 187 acres of land designated as "County Forest" land, including Morton Forest and Scheidegger Forest. A county forest consists of lands where timber is managed using sustainable methods and where some passive recreation such as hiking, cross-country skiing, foraging, wildlife observation, hunting, and snowshoeing may occur. Dane County forests have the potential to become excellent outdoor classrooms for people of all ages to learn about forest ecology, vegetation management practices, and the wildlife that use these areas. These lands also offer great demonstration areas for land management practices, such as prescribed burns, invasive species removal, and selective cutting of trees that contribute to the overall health and sustainability of forest ecosystems. The county conducts sustainable timber harvests on some properties, such as Scheidegger Forest and the Black Earth Creek Sunnyside Unit Wildlife Area, typically in partnership with WDNR. The timber harvests will be conducted to maximize the health of the forest while also serving as a source of building materials for park shelters.

WILDLIFE

Dane County has 4,220 acres of land that is designated as Wildlife Areas. These areas support a wide array of wildlife including bald eagles, oak savannahs, grassland management areas and numerous threatened or endangered species. Dane County works other agencies, landowners and communities to rebuild threatened species and reach a balance between people and animals. Dane County has a number of rare species that have been documented in the Natural Heritage Inventory Database. A list of these species is in Appendix B.

AQUATIC INVASIVE SPECIES

Aquatic invasive species (AIS) have long been recognized as a serious problem in Wisconsin and Dane County. These non-native species often times have no natural predators in the ecosystem and can quickly take over and destroy native populations. Not only does harm occur to native flora and fauna, there can be economic and in severe instances human health threats. In 2009, the Dane County LWRD developed the Dane County Aquatic Invasive Species Prevention and Control Plan which was approved by the Dane County Lakes and Watershed Commission and DNR. The plan is intended to serve as a guide for the county in developing a proactive response to problems associated with aquatic invasive species. Plan implementation involves the county working together with stakeholder groups, surrounding counties, and the state to prevent the introduction and transport of aquatic invasive species into Dane County waters. This approach helps provide regional consistency in controlling and managing AIS.

TERRESTRIAL INVASIVE SPECIES

As with AIS, Dane County's terrestrial invasive species are a significant threat and continue to spread. The largest reason is the county being bisected by two major interstate systems which are major pathways for dispersal. Species on county managed lands that are being treated include: Japanese Knotweed, Leafy Spurge, Wild Parsnip, Spotted Knapweed, Yellow and White Sweet Clovers, Japanese Hedge Parsley, Garlic Mustard, and Canada Thistle. Prioritizing treatment depends on several factors such as public health and safety (i.e. Wild Parsnip), location of the species (i.e. near a prairie remnant versus a dog park), seriousness of infestation (i.e. the smaller the infestation the higher the priority), volunteers willing to tackle the infestation and the species itself. The county has programs for controlling emerald ash borer as well as gypsy moths. An integrated pest management program which includes prescribed fire, pulling and digging, herbicide, biological control, and mowing is used to try to manage terrestrial invasive species on county-owned properties. As part of this effort, the County is continuing to invest in tools like Parsnip Predators, UTV spray tanks, and backpack sprayers. As with AIS, educational programming consisting of in-field demonstrations, class room education, and in-field work days with volunteers will continue to help control terrestrial invasive species.

CLIMATE & CLIMATE CHANGE

Dane County is characterized by a humid, continental climate. With prevailing weather patterns and winds from the west, the county experiences four distinct seasons with extreme variations in temperature and precipitation. Temperatures can range from an average low of 11 degrees Fahrenheit in January and an average high of 82 degrees Fahrenheit in July. Average annual precipitation is approximately 34 inches as rainfall and 53 inches as snowfall. May through October have the highest rainfall totals; 60% of annual precipitation falls during this time period. Frost depth averages 18-30 inches and lasts from early December through late March or early April. However, climate change is a major factor in managing the county's natural resources; particularly when looking at recent trends such as record setting rain events, flooding, warmer temperatures, and less ice through the winter months on Lakes Mendota and Monona.

In 2013, the Climate Change Action Council convened by County Executive Parisi issued an initial report with recommendations to ensure that county government is better prepared for weather extremes brought on by global climate change. The Council was charged with assessing departments throughout county government and reporting on the impact these continued weather extremes will have on county operations and residents. Findings have shown that climate change

will have serious effects on public health, public safety, and will put increased strain on county infrastructure. Information on how the county is working towards being more resilient to climate change is available on the county's website.

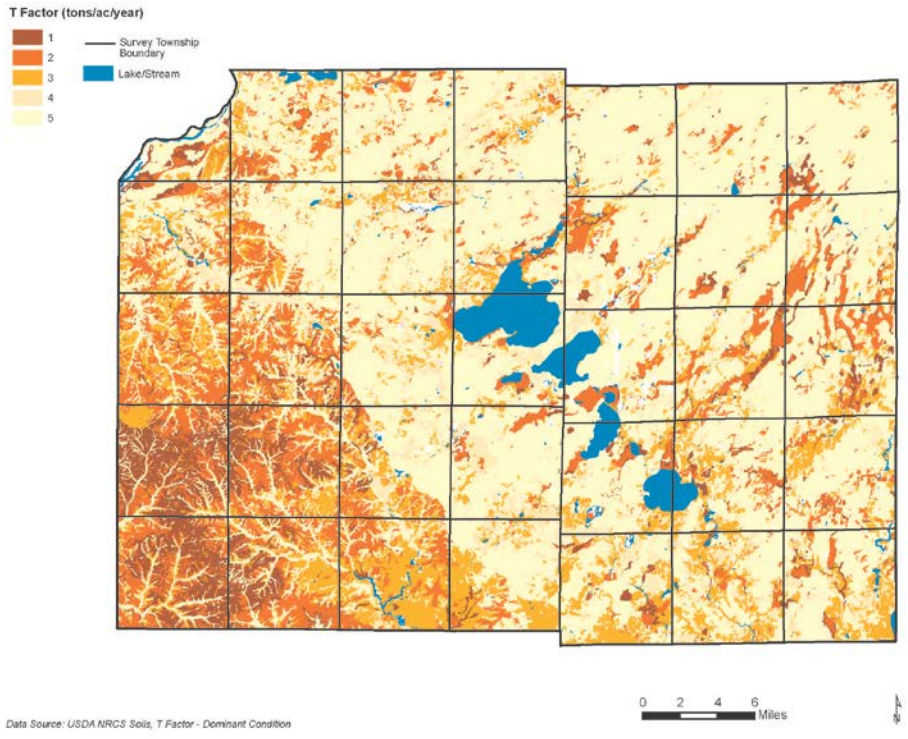
ASSESSMENT OF SOIL & WATER RESOURCES

Assessing soil and water resources is an important factor when building an implementation plan. Understanding the current conditions of the resources, allows for the development of achievable goals and an understanding of the time, funding and resources that may be needed to meet the goals.

SOIL EROSION

With some of the most productive soils in Wisconsin, agriculture is the predominant land use in Dane County. As noted in Chapter 2, corn for grain, corn for silage and soybeans are the major crops grown in the county. These crops are also typically some of the most erosive for soils if not management properly.

For Dane County, the T and K factors have been updated in recent years by USDA – Natural Resource Conservation Service (NRCS) for many soils throughout the county. The K factor is an index which quantifies how susceptible a soil is to sheet and rill erosion and can be affected by a number of soil properties such as texture, organic matter content, structure, infiltration and permeability. The T factor is the maximum amount of annual sheet and rill erosion that can occur while will maintaining soil fertility and productive capacity and can be impacted by a variety of soil properties such as texture, permeability, available water capacity and depth to restrictive layers such as rock, clay or gravel. Due to updates in these factors, some areas of the county which were previously compliant with soil erosion requirements may now exceed soil loss levels creating new challenges for education and implementation of conservation practices.



Historically, average soil loss values from the LWRD database show that in 1988 approximately 10.45 tons/acre/year county-wide while 2007 it was approximately 3.41 t/ac/yr. Over the past few years, LCD has switched to tracking tolerable soil loss (T value) and average annual soil loss (A value) spatially through nutrient management plans submitted for various program requirements. In 2016, 248 nutrient management plans covering 80,129 acres that included information on soil loss were spatially tracked. Based on the information, county-wide, the weighted average T value was 4.08 t/ac/yr and the A value was 1.46 t/ac/yr.

Figure 8: Tolerable Soil Loss (T) Values

Figure 8 shows the expected T values for soils throughout the county. Since there are a wide range of T values in the county, the county-wide average may fluctuate some depending on the location of the nutrient management plans and acres covered are in the county for annual calculations.

WATERSHEDS

Dane County contains part or all of 20 different watersheds that are part of four different basins: the Lower Wisconsin River Basin, the Grant-Platte-Sugar-Pecatonica River Basin (referred to hereafter as the Sugar-Pecatonica Basin), the Upper Rock River Basin, and the Lower Rock River Basin shown in Figure 9.

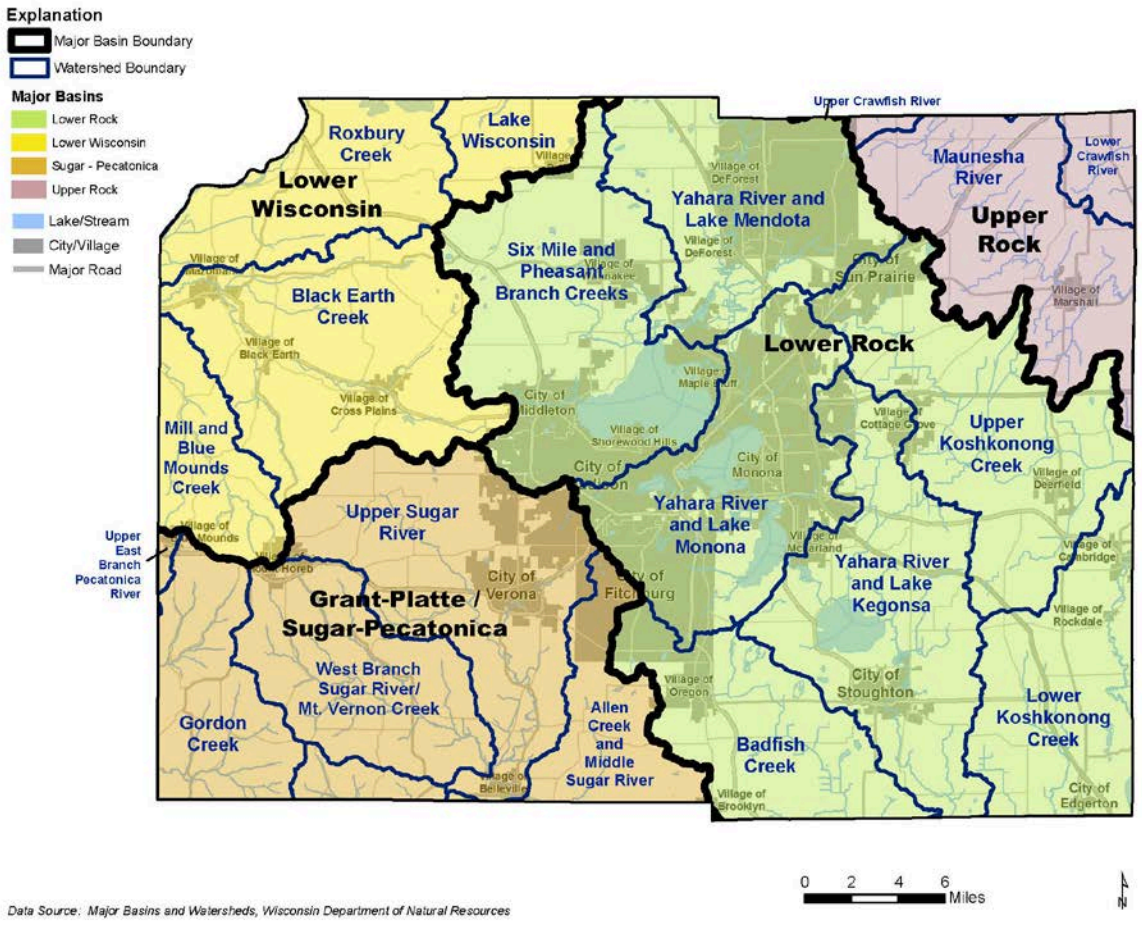


Figure 9: Basins & Watersheds

DANE COUNTY WATER QUALITY MANAGEMENT PLAN – SURFACE WATER

In 1975, Wisconsin's Governor designated Dane County as an area with complex water quality problems and the Dane County Regional Planning Commission as the local representative planning agency charged with developing a comprehensive, area-wide water quality management plan. The Regional Planning Commission worked with federal, state, and local management agencies over several years to develop the initial Dane County Water Quality Plan which included 11 technical appendices. After the Commission was dissolved in 2004, CARPC was formed to continue this role, with particular focus on future urban development area planning. The plan was adopted and certified by the state in 1979 with the latest revision for surface water occurring in 2014. The report provides an overview of water quality conditions in the county including: the importance and relationship of land use in the watershed and its effect on aquatic health; established water

quality standards and monitoring protocols; more detailed surface water condition descriptions for individual water bodies in the county; a proposed expanded monitoring program to fill data gaps and direct future efforts; and finally, future horizons in terms of more cost effective pollution control strategies and policy guidance. (CARPC, 2014)

The Dane County Water Quality Plan Appendix B: Surface Water Quality Conditions (2014) thoroughly describes the state of the surface water quality conditions in the county by watershed. Although the watersheds differ physically, common resource concerns exist throughout the county such as:

- Nutrient and sediment runoff from both agricultural and urban sources,
- Increases in the quantity of urban storm water,
- Altered stream and groundwater hydrology,
- Continued loss of aquatic and riparian habitat, and
- Less infiltration and recharge of groundwater.

SURFACE WATER IMPAIRMENTS

Dane County's waters have a number of different classifications (or designations) based on the health of the water body. According to the DNR, an outstanding resource water has excellent water quality, high recreational and aesthetic value, high quality fishing, and is free from treated wastewater discharges or runoff pollution. Point source pollution will not be allowed to these waters in the future, unless the quality of such discharges meets or exceeds the quality of the receiving water. An exceptional resource water is a stream that exhibits the same high quality resource values as outstanding waters, but may be impacted by point source pollution or may receive future discharges. Figure 10 highlights the outstanding and exceptional water resources within the county.

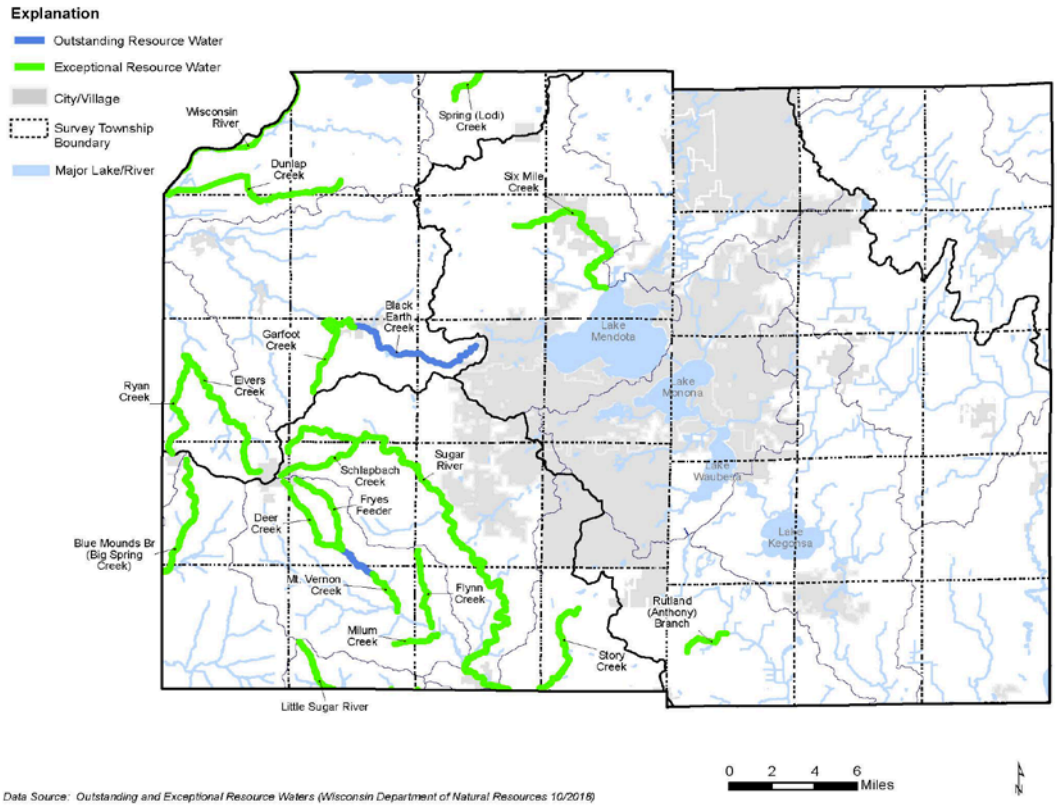


Figure 10: Outstanding & Exceptional Water Resources

Impaired waters are on a list maintained by the DNR according to Section 303(d) of the federal Clean Water Act. This list includes Wisconsin surface waters for which beneficial uses of the water (i.e. drinking, recreation, aquatic habitat, and industrial use) are impaired by pollutants. The LWRD often focuses conservation efforts on waters that do not meet the intended use. Appendix C and Figure 11 highlight the waters in Dane County that were listed and reported to the United State Environmental Protection Agency (EPA) as of 2018. As of 2018 there are approximately 60 waterbodies in the county that are listed as impaired for a range of pollutants including; total phosphorus, sediment/total suspended solids, PCB's, E. coli, chloride, BOD, unknown pollutants, and unspecified metals. An additional 20 waterbodies were proposed for listing for either total phosphorus or unknown pollutant.

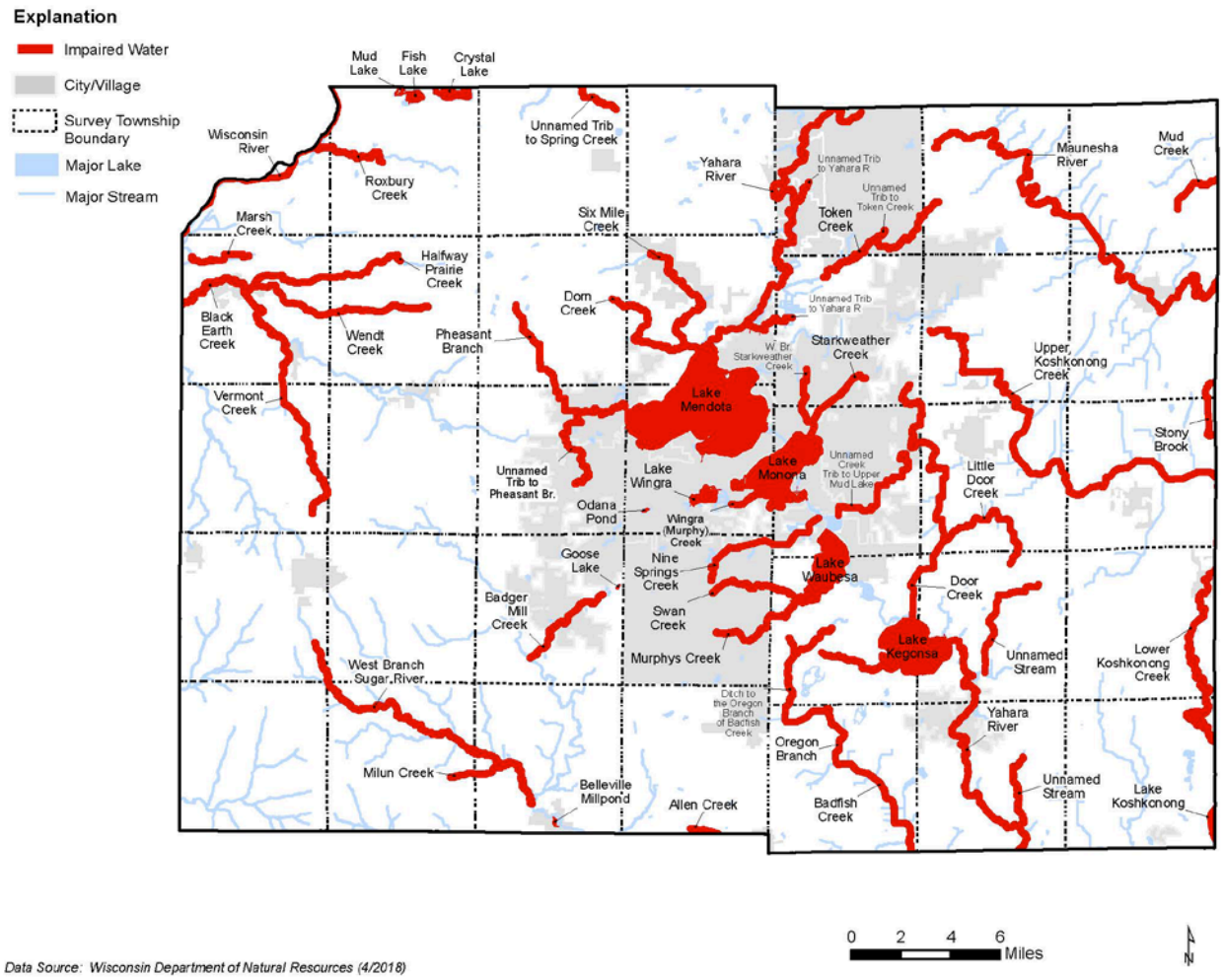


Figure 11: Impaired Waters

DRAINAGE DISTRICTS

Drainage districts are local government districts that are organized to drain lands for agricultural or other purposes. Land is drained via drainage ditches which cross individual property boundaries. Landowners in a district pay assessments to cover the cost of constructing, maintaining, and repairing the drainage system. Drainage districts affect water quality in Dane County by conveying surface and subsurface water to lakes, rivers, streams, and wetlands. This runoff transports sediment, nutrients and other pollutants directly to the water resources the ditches drain to. Figure 12 shows the location of drainage districts in the county.

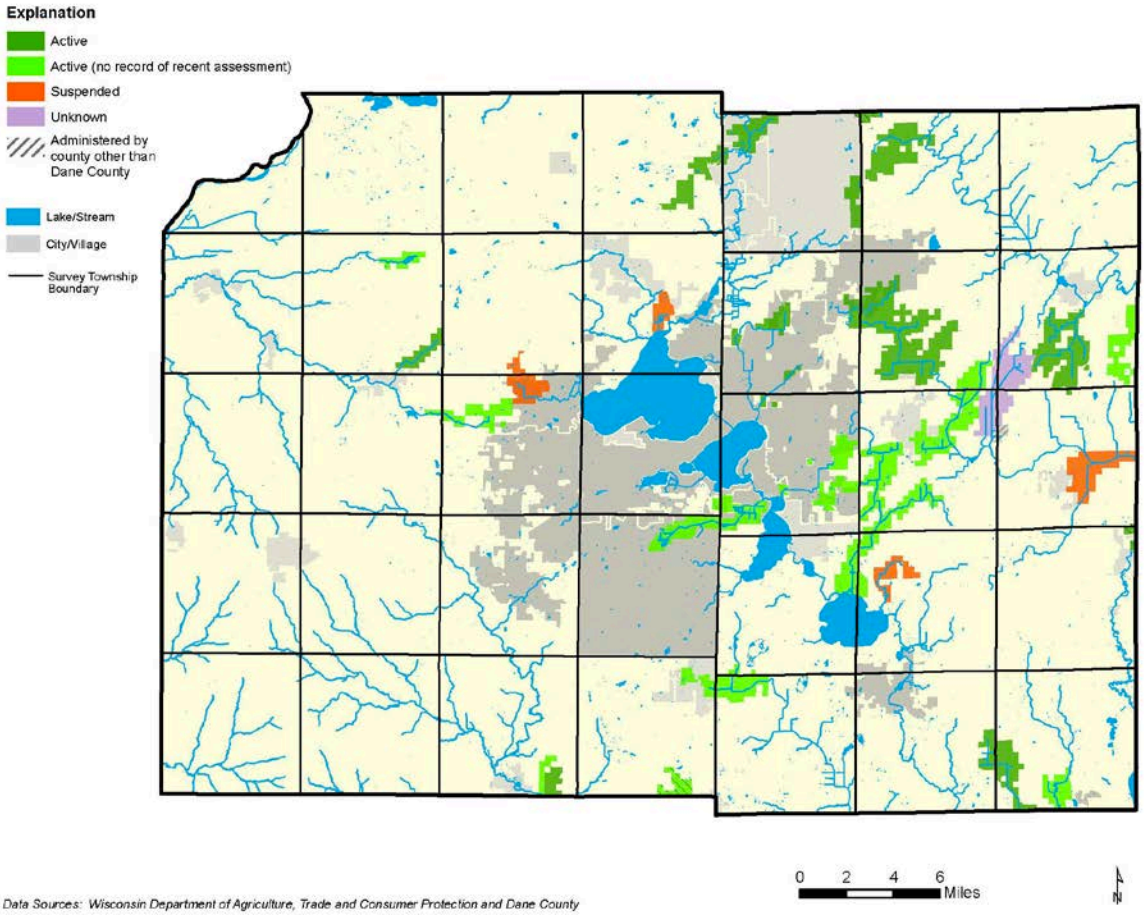


Figure 12: Drainage Districts, Dane County

DANE COUNTY WATER BODY CLASSIFICATION STUDY

The Water Body Classification Study Phase I (2007) and Phase II (2009) classifies lakes, ponds, rivers, and streams according to the current level of development and sensitivity to development. A range of protection, restoration, and enhancement strategies, as well as various management actions can be taken depending on the circumstances surrounding a particular site. This classification system allows water resource plans, policies, and programs to be tailored to meet the needs of the resource and the priorities of the community. It also provides a framework for guiding program resources, promoting cost-sharing opportunities and partnerships among various agencies and groups, and directing efforts where they will have the greatest beneficial impact.

DANE COUNTY WETLANDS RESOURCE MANAGEMENT GUIDE

The Dane County Wetlands Resource Management Guide is intended to support and encourage landowner and community-based wetland improvement projects. The information, strategies, and activities presented in the guide provide an overall framework and a variety of options for land acquisition, conservation easements, cooperative agreements, and management projects by individuals and groups in the community. The guide is meant to reflect how citizens or organizations (with their individual sets of skills, resources, and support bases) might participate in efforts to reverse the loss of wetlands in Dane County and promote water quality improvements in surface waters overall.

DANE COUNTY COMPREHENSIVE PLAN

Adopted in 2007, the Dane County Comprehensive Plan was developed to guide land use decisions for the next 20 years. In particular, Chapter 5: Agriculture, Natural and Cultural Resources outlines multiple goals for managing the county's natural environment. A key finding of the plan comes from a survey in which 86% of respondents indicated that the county should pay either "somewhat more" or "considerably more" attention to managing water resources. A number of the goals and objectives in the comprehensive plan overlap with goals and objectives in this plan in areas related to preserving agricultural lands, improving water resources, as well as addressing infiltration and flooding.

DANE COUNTY WATER QUALITY MANAGEMENT PLAN – GROUNDWATER

As part of the Dane County Water Quality Management Plan compiled by CARPC, Appendix G: Groundwater Element of the Dane County Water Quality Plan (2017) provides an in-depth assessment of the groundwater resources and concerns for the county as well as outlines actions to be taken by various stakeholders to work towards solutions. The two primary concerns relate to quantity and quality. Drawdown of water table levels in the various aquifers are exceeding the recharge rates making water conservation and addressing infiltration a priority. Figure 13 shows the major recharge areas in the county. Land use has an impact on the quality of the groundwater resources in the county. One of the primary concerns is nitrates in the groundwater. Figure 14 shows nitrate levels throughout the county. With a wide variety of land uses as potential sources for groundwater contaminants, proper management of land use and sources of contaminants is a high priority.

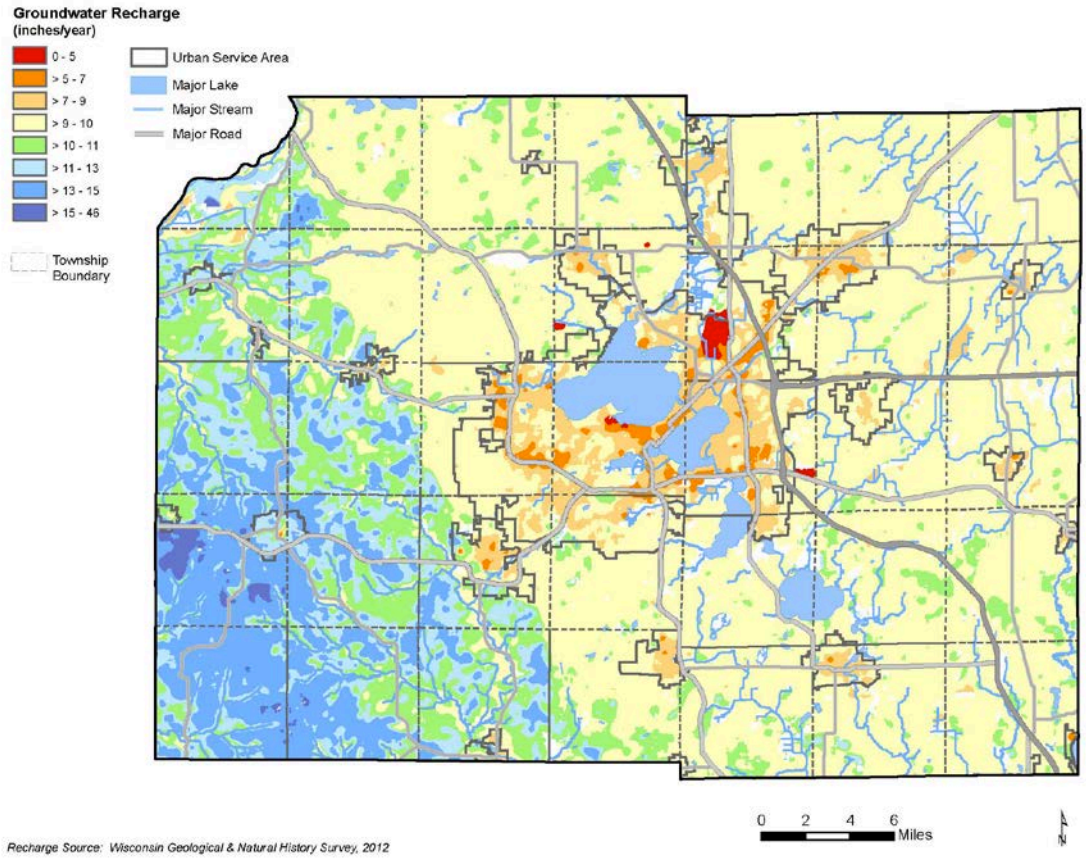
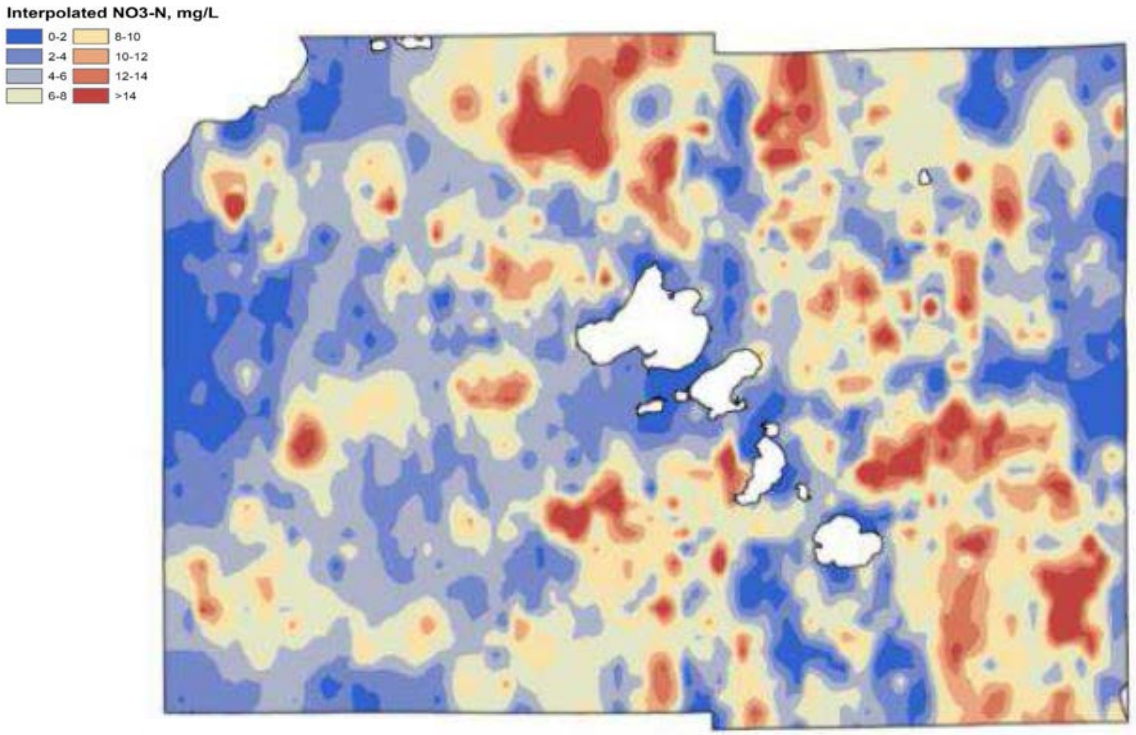


Figure 13: Groundwater Recharge Areas



Source: McDonald, Cory P. et al., 2015

Figure 14: Nitrate Concentrations in Well Water, 2014 – 2014

TMDLS

Total maximum daily loads (TMDLs) are developed for watershed around the state; typically led by DNR at the direction of EPA. TMDLs set load reduction goals for pollutants of concern. In Dane County, the Rock River TMDL is a federally approved TMDL which sets load reduction goals for phosphorus and total suspended solids (TSS). The Sugar Pecatonica Basin TMDL is also a federally approved TMDL to address sediment and TSS impairments for portions of the basin. A TMDL is in the process of being developed for the Wisconsin River Basin which includes a small portion of northwest Dane County. Where appropriate, the LWRD incorporates the TMDL goals and objectives into existing work planning and initiatives.

TARGETING PRIORITIES

Over the past 40 plus years, there have been a number of watershed projects throughout the county that have targeted resources and implementation to address resource concerns – primarily soil loss and water quality. Past projects include:

- Black Earth Creek Priority Watershed Project
- Dunlap Creek Priority Watershed Project
- Lake Mendota Priority Watershed Project
- Six Mile Pheasant Branch Priority Watershed Project
- Yahara River Lake Monona Priority Watershed Project
- Sixmile Creek Watershed Mississippi River Basin Healthy Watersheds Initiative Project
- Yahara River Regional Conservation Partnership Program Project
- Pleasant Valley/Pecatonica River Stream Restoration and Watershed Project.

Locally, the Yahara chain of lakes are an important and prominent water resource in the county facing numerous challenges. With the introduction of point source watershed compliance options and total maximum daily load assessments, new priorities and targets are being set to achieve soil loss and water quality goals. This has led to increased focus and assessment work targeted on the Yahara River Watershed.

Two Soil and Water Assessment Tool (SWAT) analyses were developed for the Yahara River which updated total suspended solids (TSS) and phosphorus loading information and reductions from the Rock River TMDL. These assessments were completed as part of the development of the Yahara CLEAN Report and Yahara WINS. Based on these analysis, Figure 15 and 16 show the loading by TMDL stream reach for the Yahara River Watershed for phosphorus and TSS. The darker areas in these figures are where the highest phosphorus and TSS loading is occurring and are the first priority areas to address for implementation.

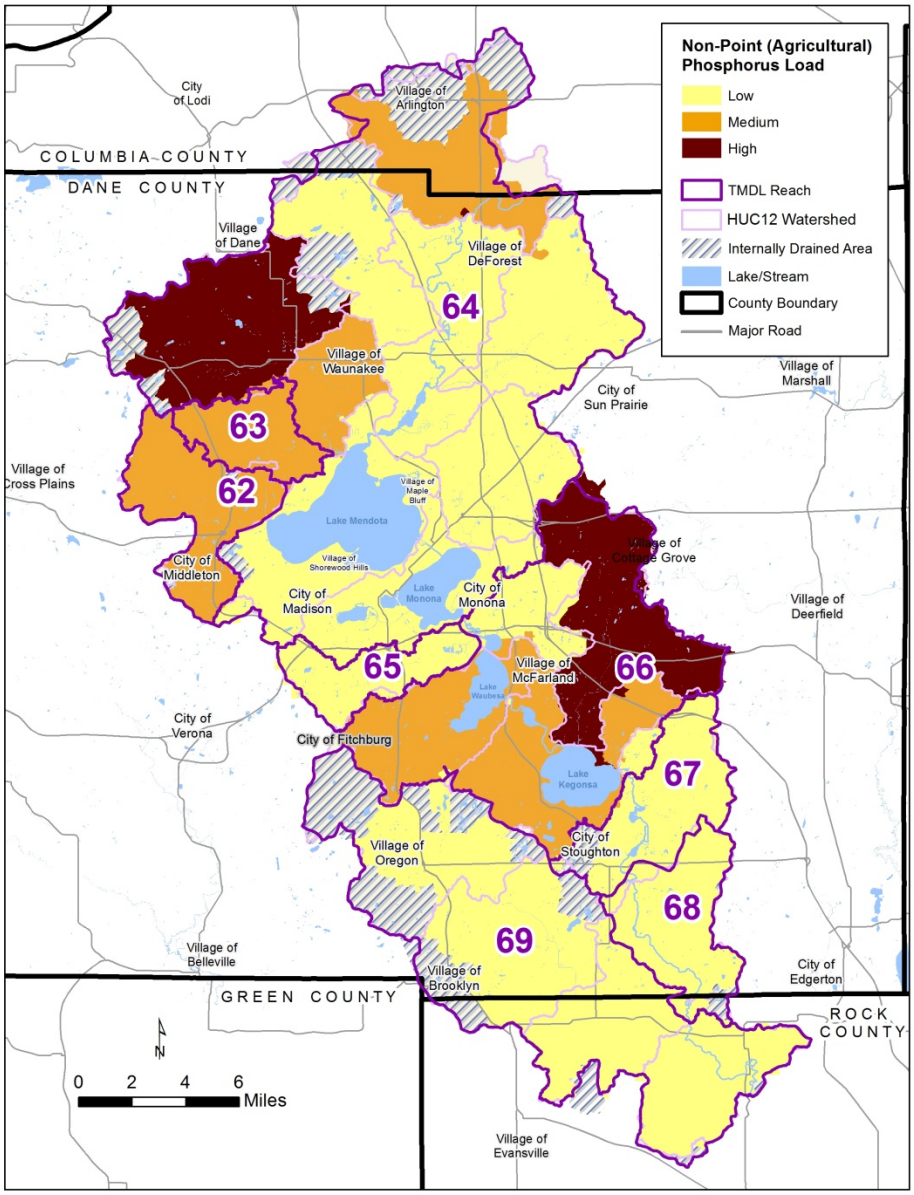


Figure 15: Phosphorus Loads from Agriculture by TMDL Stream Reach

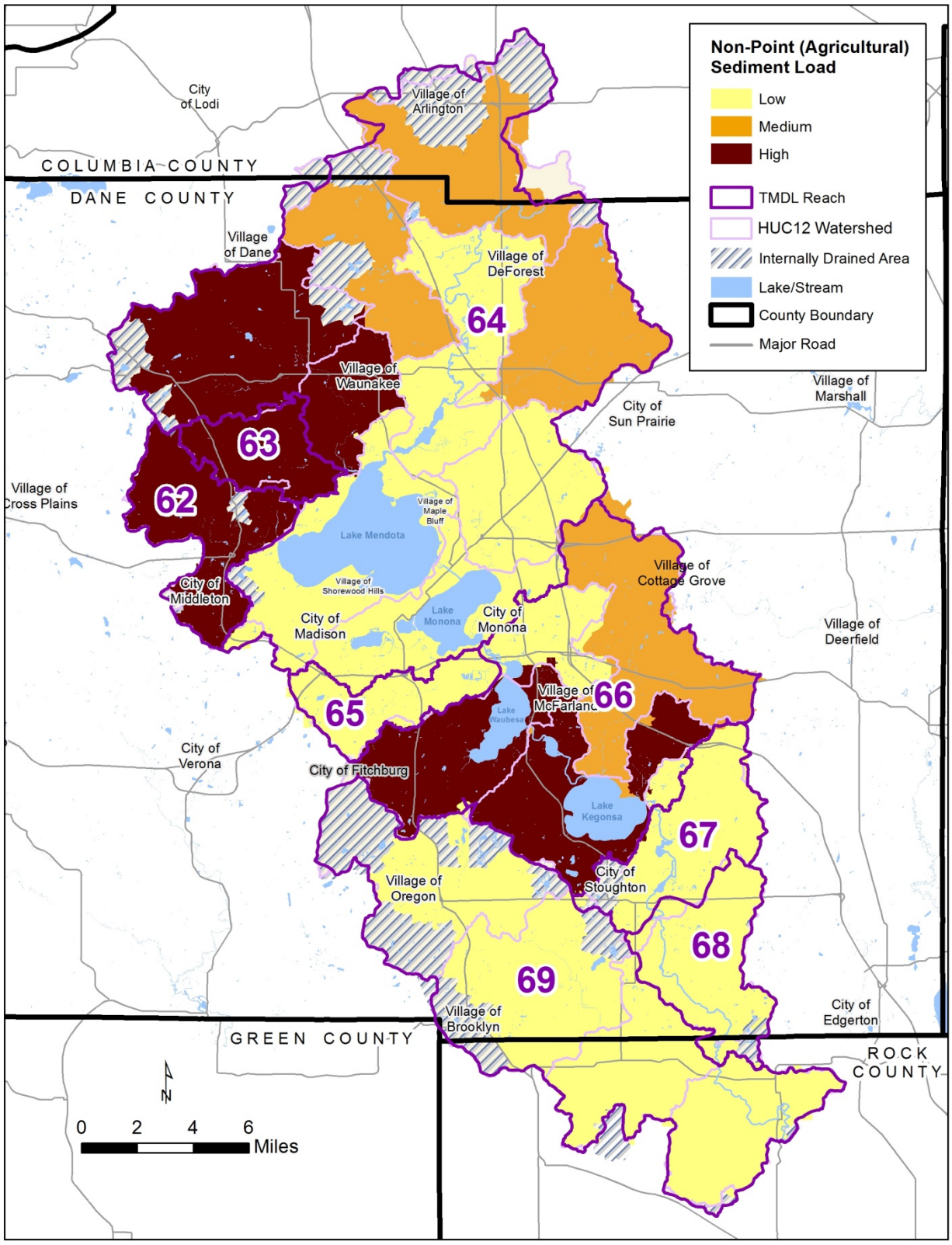


Figure 16: TSS Loads from Agriculture by TMDL Stream Reach

Load reduction goals for phosphorus and TSS, can be found in the following reports. Load reduction goals will vary by watershed depending on the land use and potential resource concerns in those watersheds.

- **Yahara Capital Lakes Environmental Assessment and Needs (CLEAN):** This effort is a partnership between the City of Madison, Dane County, DNR and DATCP to engage the community and establish clear and achievable goals as well as an implementation plan for working towards a 50% reduction in phosphorous runoff to the Yahara Chain of Lakes. The efforts started in 2008 and released the report, A CLEAN Future for the Yahara Lakes: Solutions for Tomorrow, Starting Today in 2010. Since that time, a variety of organizations have used the report to address implementation efforts including Clean Lakes Alliance who developed a Strategic Action Plan that further detailed 14 specific actions and phosphorus reduction targets. Further efforts are being considered to revisit the 2010 Yahara CLEAN report and update it with regard to progress, new information, and expanding goals.
- **Door Creek Watershed Management Action Plan:** This plan was developed in 2016 to guide implementation efforts to address phosphorous reductions and improve habitat in the Door Creek watershed. Through reference, the implementation goals and strategies of the Door Creek plan are incorporated into the LWRMP.
- **Yahara Watershed Improvement Network (WINs):** Yahara WINs is an intergovernmental entity between Madison Metropolitan Sewerage District, other point sources in the Yahara Watershed, and municipalities working toward reducing sediment and phosphorus to the Yahara Watershed through an adaptive management project. Dane County is contracted through a service agreement to provide planning and technical services to landowners for implementation of portions of the adaptive management plan.

SUMMARY

Dane County is characterized by unique geologic, topographic, natural, historical, and cultural features and resources. All of these play important roles when determining resource concerns and lay the foundation for how the county should go about targeting improvement, protection and enhancement work. The next ten years will see a focus on the Yahara Watershed through current and anticipated efforts.

CHAPTER 4: REGULATIONS, STANDARDS & PROHIBITIONS

Through provisions in 1997 Act 27 and 1999 Act 9, the Wisconsin Legislature directed the DNR to develop performance standards to control polluted runoff from non-agricultural activities, to develop performance standards and prohibitions for agricultural activities through cooperation with DATCP, and to make other changes to address polluted runoff problems from rural and urban sources. These agencies developed a number of statutes and administrative codes to meet this directive. In some cases, local governments provide assistance for implementation of these performance standards to address nonpoint sources of pollution.

REGULATORY FRAMEWORK

To address nonpoint sources of pollution, there are a number of state statutes and administrative rules that relate to the work and services LWRD provides to landowners and producers. In turn, these statutes and administrative codes are the basis for a number of county ordinances that relate to the work the LWRD does.

WISCONSIN STATUTES

The following state statutes provide the legislative authority to the various state agencies to create administrative codes for many of the programs administered by the LWRD.

CHAPTER 281, WISCONSIN STATUTES, WATER AND SEWAGE

Chapter 281, Wis. Stats., provides the authority for the creation of the nonpoint source program including the development of both urban and agricultural performance standards.

CHAPTER 92, WISCONSIN STATUTES, SOIL AND WATER CONSERVATION AND ANIMAL WASTE MANAGEMENT

Chapter 92, Wis. Stats., provides the authority for the creation of land conservation committees, land and water resource management planning, soil and water conservation programs and practices as well as ordinances for manure storage and regulation of livestock operations.

CHAPTER 33, WISCONSIN STATUTES, PUBLIC INLAND WATERS

Chapter 33, Wis. Stats., provides the authority for the creation of the Dane County Lakes and Watershed Commission and outlines the duties and powers of the commission to address surface water and groundwater issues in Dane County.

CHAPTER 91, WISCONSIN STATUTES, FARMLAND PRESERVATION

Chapter 91, Wis. Stats., provides the authority and direction for the creation of the farmland preservation program including planning, zoning, agreements, soil and water conservation and agricultural enterprise areas.

WISCONSIN ADMINISTRATIVE CODES

The following state administrative codes provide the foundation for many of the programs implemented by the LWRD.

CHAPTER NR 151, WISCONSIN ADMINISTRATIVE CODE, RUNOFF MANAGEMENT

Chapter NR 151, Wis. Adm. Code, is administered by DNR through the authority identified in ch. 281, Wis. Stats. This code identifies the performance standards to address nonpoint sources of runoff in Wisconsin including agricultural, non-agricultural, and transportation facilities.

CHAPTER ATCP 50, WISCONSIN ADMINISTRATIVE CODE, SOIL AND WATER RESOURCE MANAGEMENT PROGRAM

Chapter ATCP 50, Wis. Adm. Code, is administered by DATCP through the authority provided in ch. 92, Wis. Stats., as well as ch. 281, Wis. Stats. This code is also a companion to ch. NR 151, Wis. Adm. Code, in that is provides the tools and procedures to implement the agricultural performance standards and prohibitions. In addition, it provides much of the basis for the soil and water conservation program administered by counties outlining the land and water resource management planning procedures, grants and cost-share, best management practices, ordinances, and job approval certifications.

CHAPTER NR 243, WISCONSIN ADMINISTRATIVE CODE, ANIMAL FEEDING OPERATIONS

Chapter NR 243, Wis. Adm. Code, is administered by DNR through authority from chs. 281 and 283, Wis. Stats. This code primarily outlines the Wisconsin Discharge Pollution Elimination System (WPDES) permitting and compliance requirements for large CAFOs as well as identifies the compliance requirements for small and medium animal feeding operations. DNR primarily manages the implementation of this code but counties may play a role in implementation particularly as is relates to small and medium animal feeding operations.

CHAPTER NR 216, WISCONSIN ADMINISTRATIVE CODE, STORM WATER DISCHARGE PERMITS

Chapter NR 216, Wis. Adm. Code, is primarily administered by DNR through authority provided in ch 283, Wis. Stats., and provides additional implementation procedures to for the non-agricultural and transportation performance standards in ch. NR 151, Wis. Adm. Code. Municipalities have the ability to develop authorized local programs to implement the construction site storm water requirements at the local level.

CHAPTER NR 154, WISCONSIN ADMINISTRATIVE CODE, BEST MANAGEMENT PRACTICES AND COST SHARE CONDITIONS

Chapter NR 154, Wis. Adm. Code, identifies the best management practices, technical standards and cost-share conditions for grants issued by DNR under chs. NR 153 and 155, Wis. Adm. Code. For the agricultural practices, it directly cross-references to the best management practices identified in ATCP 50, Wis. Adm. Code.

CHAPTER NR 153: TARGETED RUNOFF MANAGEMENT AND NOTICE OF DISCHARGE GRANT PROGRAMS

Chapter NR 153, Wis. Adm. Code, provides DNR the administrative structure for the targeted runoff management and notice of discharge grant programs which the LWRD may utilize to address water quality problems associated with rural nonpoint sources of pollution.

CHAPTER NR 155: URBAN NONPOINT SOURCE WATER POLLUTION ABATEMENT AND STORM WATER MANAGEMENT GRANT PROGRAM

Chapter NR 155, Wis. Adm. Code, provides DNR the administrative structure for the grant program used to abate urban nonpoint source water pollution and storm water runoff to achieve water quality standards, minimize flooding, protect groundwater, coordinate urban nonpoint source management activities under the municipal storm sewer discharge permit program and implement non-agricultural nonpoint source performance standards. The LWRD may utilize these grants to address urban nonpoint source water pollution or storm water management activities.

DANE COUNTY CODE OF ORDINANCE

Dane County has developed a number of ordinances to address local resource concerns and incorporate, where necessary, state requirements. The following ordinances are typically implemented by the LWRD.

CHAPTER 14: MANURE MANAGEMENT, EROSION CONTROL AND STORMWATER MANAGEMENT

Chapter 14, Dane County Code of Ordinance, provides the county authorization to issue permits for a variety of activities addressing water quality and soil erosion. Permits include: manure storage facility construction or modification, proper closure of manure storage facilities, winter spreading of stored pumpable liquid manure, construction site erosion control, and post construction storm water management. The ordinance outlines the regulatory requirements, permit criteria and enforcement procedures for compliance with the applicable standards..

As of the writing of this plan, LWRD is working on an update to the ordinance. The goals of the update include: separating the manure management components from the erosion control and storm water management components into a stand-alone ordinance; updating technical standards, definitions and permit conditions to be in line with recent state and federal rule revisions; incorporating the agricultural performance standards, prohibitions and compliance procedures from ch. NR 151, Wis. Adm. Code; and introducing a new certificate of use program for existing manure storage structures. Many of these changes are proposed as a result of the Healthy Farms Healthy Lakes Task Force recommendations and are being proposed in the 2019 county budget with an anticipated effective date of sometime in 2019.

CHAPTER 10: COUNTY ZONING

Chapter 10, Dane County Code of Ordinance, governs the use of publicly and privately owned land and consists ordinance text that includes standards and provisions for each zoning district and a map of the zoning districts in the county. County zoning applies to all towns in the county except the Towns of Berry, Springfield, Westport, Bristol, Sun Prairie, and Blue Mounds as well as the cities and villages within the county. The ordinance is administered by the Dane County Planning and Development Department. However, LWRD collaborates with Planning and Development on certain aspects of implementation such as exclusive agricultural zoning as it relates to implementation of the Farmland Preservation Program under ch. 91, Wis. Stats. As of the writing of this plan update, this ordinance is in the process of being updated and will likely be effective in 2019.

CHAPTER 11: SHORELAND, SHORELAND-WETLAND AND INLAND-WETLAND REGULATIONS

Chapter 11, Dane County Code of Ordinance, includes standards to maintain safe and healthful conditions and prevent and control water pollution; protect spawning grounds, fish and aquatic life; control building sites, placement of structures and land uses; and preserve and restore shoreland vegetation and natural scenic beauty. Collaboration between Planning and Development and LWRD happens on a variety of conservation related projects. The ordinance is primarily administered by Planning and Development; however, LWRD through WRE implements the shoreland erosion control permitting and mitigation.

CHAPTER 13: MINIMUM STANDARDS FOR WATER QUALITY

Chapter 13, Dane County Code of Ordinance, establishes the advisory authority for the Dane County Lakes & Watershed Commission to recommend standards for water quality purposes in order to protect public health, safety and welfare as well as protect and rehabilitate the water quality of the surface waters and groundwaters of Dane County. LWRD provides staffing support to the Lakes & Watershed Commission.

CHAPTER 74: NON-METALLIC MINING

Chapter 74, Dane County Code of Ordinance, establishes the reclamation requirements for non-metallic mining sites in Dane county and provides uniform and predictable reclamation standards in accordance with state requirements. While Planning and Development oversees the ordinance, LWRD provides assistance by reviewing the implementation, operation and reclamation plans to ensure that erosion control and storm water management requirements are being met.

AGRICULTURAL PERFORMANCE STANDARDS & PROHIBITIONS

As described above, ch. NR 151, Wis. Adm. Code, describes the agricultural performance standards and prohibitions for all cropland and livestock operations in Wisconsin. The primary mechanism to implement these standards and prohibitions is

through county land conservation departments through the LWRMP and the development of a ch. NR 151, Wis. Adm. Code, implementation strategy and enforcement procedures.

AGRICULTURAL PERFORMANCE STANDARDS

The agricultural performance standards identified in ch. NR 151, Wis. Adm. Code, address runoff from agricultural facilities, operations and practices. Standards apply to both cropland and livestock operations. Compliance and enforcement procedures are also outlined in the code; though, in many cases, there is an obligation to offer cost-share funding to the landowner or operator to require compliance making funding a limiting factor to implementation. Table 2 identifies the agricultural performance standards, the type of agricultural operation the standard applies to and when the standard became effective.

MANURE MANAGEMENT PROHIBITIONS

The manure management prohibitions are identified in both ch. 281, Wis. Stats., and ch. NR 151, Wis. Adm. Code. In addition, the prohibitions were incorporated into county ordinance in 2006 which provides the county the authority to enforce compliance as needed. The following prohibitions apply to livestock operations:

- No overflow of manure storage facilities.
- No unconfined manure piles in a water quality management area.
- No direct runoff from a feedlot or stored manure into the waters of the state.
- No unlimited access by livestock to waters of the state in a location where high concentrations of animals prevent the maintenance of adequate sod or self-sustaining vegetative cover.
    - Does not apply to properly designed, installed and maintained livestock or farm equipment crossings.

PRIORITIZING FARMS

Implementation of the agricultural performance standards and prohibitions falls primarily to county land conservation offices. An implementation strategy to prioritize staff efforts and resources is necessary to systematically work with the landowners in the County to address resource concerns and conservation needs. In general, the following criteria are evaluated in order to provide a framework for prioritizing workload based on priority farms:

1. **Complaints:** Priority farms include those operations that the County receives formal complaints on and have the potential to impact surface waters or groundwater or violate the performance standards and prohibitions.

2. **Voluntary Interest:** Many landowners are interested in improving their land and voluntarily reach out to the County to assist them with addressing resource concerns and conservation needs.

3. **Targeting Watersheds:** Through the years, many implementation programs have required targeting watersheds to focus implementation efforts. Inventories may be conducted of watersheds to identify priorities for implementation and compliance. With the onset of Wisconsin's phosphorus rules, new projects revolving around point source compliance options working with nonpoint sources are on the rise and creating new targeted priority areas.

4. **Farmland Preservation Program:** Status reviews for existing Farmland Preservation Program (FPP) participants are completed on a four-year rotation for compliance with the applicable agricultural performance standards and prohibitions.

5. **Other Resources:** Projects, new priorities and funding opportunities can set new targets for implementation. These are evaluated as they arise to determine where work associated with this special projects should fit in the prioritization of workload. Examples may include the purchasing of new county property, grant awards, or weather related issues.

Table 2: Wisconsin Agricultural Performance Standards

Standard	Description	Operation Type	Effective Date
Sheet, rill and wind erosion performance standard (NR 151.02)	All land where crops or feed are grown, including pastures, shall be managed to achieve a soil erosion rate equal to or less than the "tolerable" (T) rate established for that soil.	Crop Producers Pastures	10/1/2002 (cropland) 7/1/2012 (pastures)
Tillage setback performance standard (NR 151.03)	Prevent tillage operations from destroying stream banks and depositing soil directly in surface waters.	Crop producers Tillage operations	1/1/2011
Phosphorus index performance standard (NR 151.04)	Croplands, pastures and winter grazing areas shall have an average phosphorus index of 6 or less over the accounting period and not exceed a phosphorus index of 12 in any individual year within the accounting period.	Crop producers Livestock producers	1/1/2011 7/1/2012 (pastures)
Manure storage facilities performance standard (NR 151.05)	New or substantially altered manure storage facilities shall be designed, constructed and maintained to minimize the risk of structural failure and leakage. Manure storage facilities located where operations have ceased or manure has not been added or removed for a period of 24 months shall be closed to prevent future contamination of surface waters and groundwater. Existing manure storage facilities that pose an imminent threat to public health, fish and aquatic life or groundwater shall be upgraded, replaced or abandoned.	Livestock producers	10/1/2002 1/1/2011 (new or significantly altered facilities designed and operated to address additional runoff and precipitation from a 25-year, 24-hour storm event)
Process wastewater handling performance standard (NR 151.055)	No significant discharge of process wastewater to waters of the state.	Livestock producers	1/1/2011
Clean water diversion performance standard (NR 151.06)	Divert runoff away from feedlots, manure storage areas and barnyards within water quality management areas.	Livestock producers	10/1/2002
Nutrient management (NR 151.07)	All manure or other nutrients applied directly or through contract to agricultural fields shall follow a nutrient management plan.	Crop producers Livestock producers	10/1/2003 (new cropland) 1/1/2005 (existing cropland within identified water resource areas) 1/1/2008 (all other existing cropland)
*Silurian bedrock performance standard (NR 151.075)**	Manure applied to cropland or pastures in areas of Silurian bedrock (as defined) cannot cause fecal contamination of wells, not be applied on areas 24 inches or less to bedrock and follow a nutrient management plan.	Crop producers Livestock producers	7/1/2018

* Does not apply to Dane County

COMPLIANCE PROCESS

The LWRD follows a stepped enforcement process for all compliance issues including ordinance violations and concerns associated with the agricultural performance standards and prohibitions. In all cases as appropriate, LWRD will follow the determination and notification requirements outlined in either ordinance or s. NR 151.09 or NR 151.095, Wis. Adm. Code. Figure 17 outlines the steps are used to address compliance issues in conjunction with the priority farm determinations:

Information & Education

- Providing information and eduction to landowners is the primary method ustilized to increase awareness of the agricultural performance standards and prohibitions as well as conservation practices and systems.

Voluntary Compliance

- Working with landowners through voluntary compliance is the primary method of implementation to work toward compliance with the agricultural performance standards and prohibitions.

Compliance Determinations

- Compliance determinations are issued as necessary to document compliance status with ordinance or agricultural performance standards and prohibition requirements.

Notice of Noncompliance

- Issuance of a notice of noncompliance puts a landowner on notice that there is a noncompliance issue with regard to the ordinance or agricultural performance standards and prohibitions. An offer of cost-share funding will be made as necessary.

Notice of Violation

- Issuance of a notice of violation notifies the landowner of a direct violation and may be issued based on the nature of the violation or lack of progress being made to remedy the issue through the voluntary or noncompliance process.
- Fines may be issued depending on the nature and severity of the violation.

Referral

- For violations the County can enforce, referrals are made to the Dane County Corporation Counsel.
- For violations the County is unable to enforce through ordinance, referrals will be made to the Department of Natural Resources.

Documentation

- All work associated with compliance determinations and enforcement will be tracked in the appropriate database systems by parcel.

Figure 17: Overview of Compliance Process

NON-AGRICULTURAL PERFORMANCE STANDARDS

It is widely understood that land development without effective best management practices results in changes to the rainfall-runoff process. Replacing vegetation with impervious surfaces (i.e., asphalt or concrete pavement and rooftops) and altering the natural drainage system (i.e., replacing natural swales with storm sewer) results in increased runoff rates, longer runoff durations, increased runoff volumes, and decreased infiltration.

The Dane County Board of Supervisors adopted the Erosion Control and Stormwater Management Ordinance effective August 22, 2002, acting on the recommendation of the Dane County Lakes and Watershed Commission after 11 public hearings and hundreds of hours of meetings with citizens, technical experts, developers, builders, local municipalities, and other stakeholders. The Board found that construction site erosion and uncontrolled storm water runoff from land disturbing and land development activities have significant adverse effects upon regional water resources including the health, safety, property and general welfare of the community, diminishing the public enjoyment and use of natural resources. The Board also found that effective erosion control, sediment and storm water management depends on proper planning, design, timely installation and continued maintenance of erosion control and storm water management practices. Specifically, they found that soil erosion and storm water runoff can:

- carry sediment, nutrients, pathogens, organic matter, heavy metals, toxins and other pollutants to regional lakes, streams and wetlands;
- diminish the capacity of water resources to support recreational and water supply uses and a natural diversity of plant and animal life;
- clog existing drainage systems, increasing maintenance problems and costs;
- cause bank and channel erosion;
- increase downstream flooding;
- reduce groundwater recharge, which may diminish stream base flows and lower water levels in regional lakes, ponds and wetlands;
- contaminate drinking water supplies;
- increase risk of property damage and personal injury; and
- cause damage to agricultural fields and crops.

Residential development has been primarily located in and around cities and villages. With current and projected growth around these developed areas, protecting undeveloped land natural areas becomes a priority.

In 2007, the LWRD took over sole responsibility for issuing erosion control and storm water management permits and conducting inspections. Monitoring permit activity in the county helps LWRD staff with workload planning and with meeting ordinance-required inspections. The ordinance sets countywide standards and gives the necessary flexibility to local governments and developers so they can administer and meet those standards effectively and efficiently. The ordinance is administered by the LWRD in unincorporated areas (towns). Cities and villages (incorporated areas) administer the ordinance if they have adopted storm water and erosion control standards at least as restrictive as the county ordinance.

SUMMARY

Having clear and defined requirements for agriculture and non-agricultural land uses is important to make progress towards the goals and objectives of this plan. Systematic implementation of the performance standards and prohibitions in a program agnostic format allows for LWRD to work with landowners through a variety of programs to ensure the best conservation system for their needs while also working towards achieving compliance.

CHAPTER 5: GOALS & OBJECTIVES

Developing and updating a LWRMP is a year-long process that incorporates a variety of steps. Input from citizens and resource professionals is important to the development and prioritization of goals and objectives that will be the foundation of annual work plans for the next ten years.

LOCAL ADVISORY COMMITTEE

Part of the requirements for developing and updating a LWRMP includes the use of a local advisory committee to help gauge local priorities. A local advisory committee is comprised of citizens and resource professionals representing a wide range of interests. In some cases, it may be beneficial to split the local advisory committee into two committees: a citizen advisory committee and a technical advisory committee. For the 2018 update, one combined local advisory committee was used. Table 3 lists the members of the local advisory committee and their affiliations.

Table 3: 2018 Local Advisory Committee Members

Name	Affiliation(s)
Adam Dowling	NRCS Dane County District Conservationist
Heidi Johnson	Dane County UWEX Crops and Soils Educator
Mike Sorge	DNR Water Quality Supervisor
Joleen Stinson	Village of DeForest Parks and Natural Resources Supervisor
Dave Ripp	County Board Supervisor, District 29 • Lakes & Watershed Commission • UW Extension Committee • Park Commission
Becky Olson	Autumn Moon Farm
Kay Hoffman	Hoffman Farms at Windsor, LLC Dane County Farm Services Agency Committee Dane County Land Conservation Committee
Caleb Pourchot	Groundswell Conservancy
John Haeckel	Clean Fuel Partners
Martye Griffin	Madison Metropolitan Sewerage District Yahara Watershed Improvement Network (WINS)
Mitch Breunig	Mystic Valley Dairy, LLC
Sarah Fuller	Capital Area Regional Planning Commission
Eric Birschbach	Ag Site Crop Consulting, LLC
Lynne Diebel	Friends of Badfish Creek Watershed
Phil Gaebler	City of Madison, Water Resources Engineer
Chris Homburg	Homburg Inc.
Paul Dearlove	Clean Lakes Alliance
Dale Gasser	DNR Regional Nonpoint Source Coordinator

Two local advisory committee meetings were held: the first was on April 26, 2018 and the second was on July 25, 2018. For the April meeting, the local advisory committee focused on a brainstorming activity to identify goals and objectives. LWRD staff then merged the goals and objectives from the brainstorming activity with those identified in the current LWRMP. At the July meeting, the committee prioritized the objectives under each goal and discussed actions that could be accomplished to meet objectives. Input for both meetings as also accepted electronically for those members that were not able to attend in person. Committee members were then sent a draft of the full

LWRMP update to review and provide comments on electronically. Meeting agendas and the public notice press release can be found in Appendix D.

GOALS, OBJECTIVES & ACTIONS

Through the local advisory committee meetings and using data from previous land and water resource management plans, five primary goals have been established for this plan update. A goal is an observable and measureable end results having one or more objectives to be achieved within a more or less fixed timeframe. Each goal has a series of objectives under them. An objective is a specific result to be achieved within a time frame and with available resources that is more specific and easier to measure than goals. The objectives are ranked by priority of high, medium and low. Actions are listed for each of the objectives. Actions are the specific tasks that will build the work plans to make progress towards meeting goals and objectives within certain timeframes.

Goal I: Assess, protect and improve surface water and groundwater resources

- Reduce the quantity of sediment and nutrients reaching surface waters and groundwater. (H)
- Decrease the amount of pharmaceutical compounds reaching surface waters and groundwater. (L)
- Improve soil health to reduce soil erosion, improve infiltration and reduce nutrient loses. (H)
- Build awareness regarding economic and environmental value of developing and implementing a nutrient management plan (L)
- Assess and protect groundwater resources. (H)
- Improve and enhance erosion control and storm water management runoff to reduce the quantity and improve the quality of runoff. (H)
- Reduce salt utilization to minimize impacts on surface water and groundwater resources. (M)

Goal II: Maintain viable agricultural lands for long-term production

- Reduce the rate of urban expansion by preserving priority farmlands and open spaces. (M)

Goal III: Develop, explore and implement innovative ideas

- Encourage new methods of water quality improvement. (M)
- Enhance renewable energy opportunitities. (L)

Goal IV: Protect and enhance in-stream, riparian, wetland and upland habitates

- Protect, restore and stabilize stream banks and shorelines. (H)
- Restore wetland and upland habitat. (M)
- Protect springs. (H)
- Minimize conversion of wetlands to agricultural and urban development. (M)
- Develop/expand invasive species program (i.e. aqutic and terrestrial species) aimed at preventing the introduction of new species and reducing existing epecies. (L)

Goal V: Partner with and involve citizens on soil and water protection initatives

- Support individuals, watershed groups and organizations with education about resource improvement and pollution prevention. (M)
- Educate urban and rural resdients on health and value of land and water resources and protection measures. (M)
- Educate and inform the public about threats posed by aquatic and terrestrial invasive and exotic species. (M)
- Inform and educate county, municipal and town officialsl on the health and value of land and water resources. (L)
- Promote recreational opporutnities. (M)
- Make grants available to local units of government and non-profits to protect and enhance land and water resources. (H)
- Work with agencies, consultants, contractors and developers to ensure erosion control and storm water management are met. (L)
- Promote partnerships to leverage funding and resources for conservation practices in order to target funding or resource gaps. (M)

Figure 18: Summary of Goals & Objectives

These goals, objectives and actions are used to develop annual work plans to be submitted to DATCP as part of the annual grant process. Figure 18 summarizes the goals and objectives. Appendix E has the full 10-year work plan including priorities and actions.

ESTIMATED RESOURCES

As identified in Chapter 3, the Yahara River and Badfish Creek Watersheds are the portion of the county that will be the primary source for targeted implementation of the goals, objectives and actions in this plan. Tables 4, 5 and 6 estimate the staff resources and cost-share funding needed to accomplish the goals of this plan over the next 10 years in the Yahara River and Badfish Creek Watersheds by TMDL reach. Additional estimates of resource needs are found in the Yahara CLEAN report, Yahara WINS Adaptive Management Plan and Door Creek Watershed plan. The estimates for the Yahara River and Badfish Creek Watersheds do not include: ongoing practice verification through the life of the practice, major information and education efforts, work completed outside of the Yahara and Badfish Watersheds, or broader LWRD goals.

Table 4: Funding Needs for Practice Implementation in the Yahara & Badfish Watersheds by TMDL Reach

Reach	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
62	$253,986	$260,604	$340,274	$321,577	$367,953	$279,479	$269,850	$235,222	$221,553	$241,835
63	$74,023	$371,567	$90,278	$140,812	$222,883	$301,445	$165,772	$193,367	$86,610	$81,052
64	$524,176	$513,310	$586,494	$617,517	$630,585	$690,638	$720,998	$1,177,038	$1,212,193	$1,211,082
65	$56,382	$103,758	$84,047	$126,293	$121,356	$88,064	$134,248	$92,710	$117,417	$124,349
66	$1,135,511	$803,478	$804,561	$644,689	$1,012,781	$1,025,234	$1,095,140	$1,684,711	$1,513,039	$1,694,394
67	$11,880	$12,566	$13,241	$30,168	$0	$0	$0	$13,606	$29,719	$14,161
68	$120,056	$232,479	$129,714	$159,968	$156,767	$259,245	$186,390	$177,640	$231,050	$179,115
69	$284,008	$704,601	$424,909	$437,356	$382,103	$485,917	$723,726	$579,208	$632,855	$533,185
Total	**$2,460,022**	**$3,002,362**	**$2,473,518**	**$2,478,379**	**$2,894,428**	**$3,130,021**	**$3,296,124**	**$4,153,501**	**$4,044,436**	**$4,079,173**

Table 5: Funding Needs for Staffing for the Yahara & Badfish Watersheds by TMDL Reach

Reach	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
62	$110,107	$112,975	$146,038	$151,494	$171,573	$128,975	$123,234	$106,289	$99,048	$106,952
63	$69,762	$88,656	$84,230	$102,365	$160,374	$76,666	$111,966	$129,229	$57,267	$75,608
64	$249,220	$234,655	$275,528	$287,172	$290,257	$336,319	$329,287	$531,907	$541,966	$535,647
65	$18,408	$33,875	$27,166	$40,408	$38,432	$27,601	$41,639	$28,452	$35,651	$37,350
66	$845,061	$571,347	$566,396	$449,265	$752,062	$895,563	$810,605	$1,233,869	$1,096,349	$1,345,830
67	$10,662	$11,278	$11,983	$27,025	$0	$0	$0	$11,691	$29,060	$13,698
68	$65,241	$126,334	$69,785	$85,191	$82,635	$135,244	$96,224	$90,741	$116,768	$89,548
69	$158,166	$351,823	$210,045	$214,014	$194,056	$244,235	$359,976	$285,061	$308,150	$256,827
Total	**$1,526,627**	**$1,530,944**	**$1,391,171**	**$1,356,933**	**$1,689,388**	**$1,844,602**	**$1,872,929**	**$2,417,239**	**$2,284,259**	**$2,461,462**

Table 6: Staffing Hours for the Yahara & Badfish Watersheds by TMDL Reach

Reach	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
62	1835	1883	2434	2525	2860	2150	2054	1771	1651	1783
63	1163	1478	1404	1706	2673	1278	1866	2154	954	1260
64	4154	3911	4592	4786	4838	5605	5488	8865	9033	8927
65	307	565	453	673	641	460	694	474	594	623
66	14084	9522	9440	7488	12534	14926	13510	20564	18272	22431
67	178	188	200	450	0	0	0	195	484	228
68	1087	2106	1163	1420	1377	2254	1604	1512	1946	1492
69	2636	5864	3501	3567	3234	4071	6000	4751	5136	4280
Total	**25444**	**25516**	**23186**	**22616**	**28156**	**30743**	**31215**	**40287**	**38071**	**41024**

To estimate resource needs at a county-wide level, Table 7 shows how the estimates above scale to the entire county. The Yahara River and Badfish Creek Watersheds encompass roughly one third of the county so by multiplying these estimates by three, estimated resources for the entire county for implementation of agricultural practices to address soil erosion and water quality are calculated. These estimates are based on a number of factors such as: Dane County average costs for conservation practices, typical practices implemented in the county, common funding sources and rates, average hours spent on planning and technical services per practice type, and historical practice implementation information. These numbers are conservative and likely under estimate the resources needed to fully implement the plan without using targeted approaches.

Table 7: Estimated Resource Needs for County-wide Implementation

	Funding for practice implementation	Funding for staffing needs	Estimated staffing hours	Estimated staff needs
2019	$7,380,066	$4,579,881	76,332	42
2020	$9,007,086	$4,592,832	76,548	43
2021	$7,420,554	$4,173,513	69,558	39
2022	$7,435,137	$4,070,799	67,848	38
2023	$8,683,284	$5,068,164	84,468	47
2024	$9,390,063	$5,533,806	92,229	51
2025	$9,888,372	$5,618,787	93,645	52
2026	$12,460,503	$7,251,717	120,861	67
2027	$12,133,308	$6,852,777	114,213	63
2028	$12,237,519	$7,384,386	123,072	68

SUMMARY

The goals, objectives and actions developed through the local advisory committee and public comment process will guide the work planning for the next ten years. It is important to work towards these goals while still maintaining flexibility to be able to adapt to new or emerging issues as the plan ages.

CHAPTER 6: TOOLS & STRATEGIES

Methods to implement the goals, objectives and actions of this plan are important to any implementation strategy. The following outlines many of the tools and strategies Dane County uses.

INFORMATION & EDUCATION

LWRD will employ a number of information and education methods in order to meet the goals outlined in this plan. This includes educational and training opportunities but also programs that work toward attitude and behavior changes that are necessary for long-term land and water conservation.

TARGET AUDIENCES

Catering information and education to specific audiences helps ensure the messaging meets the needs of the targeted group. Common audiences LWRD tries to target include:

- Agricultural producers;
- Landowners;
- Urban residents;
- Agricultural service providers;
- City, town, village, and county officials;
- Youth; and
- Partner organizations such as watershed groups, environmental organizations, parks friends groups.

INFORMATION SHARING STRATEGIES

How to disseminate information is also key when targeting audiences for educational purposes. LWRD utilizes the following methods as strategies to educate and inform residents:

- Issuing press releases on timely issues;
- Distributing information via Constant Contact newsletters;
- Educating the public through websites and social media pages;
- Developing articles on timely issues that local groups can use in their newsletters and publications;
- Tabling displays at local events such as the Fishing Expo, Garden Expo, Breakfast on the Farm, etc.;
- Developing education materials that address areas of concern or frequent questions raised by the public;
- Distributing information developed by others (e.g. UWEX, DNR, NRCS, etc.); and
- Publishing an annual report highlighting accomplishments and project updates.

ENGAGEMENT STRATEGIES

In addition to targeting audiences and providing information, using strategic engagement strategies to achieve goals that require voluntary behavior changes are vital to a robust information and education program as well as to accomplish the goals and objectives of the plan. Without involvement and buy-in from impacted stakeholders, change cannot occur. Examples of engagement strategies that will be used by LWRD to meet the goals and objectives of this plan include:

- One-on-one interactions with agricultural producers and landowners;
- Conduct educational workshops, forums, and field demonstrations;
- Hold trainings and capacity building workshops for targeted audiences and stakeholders;

- Host and promote land and water-related volunteer opportunities; and
- Work with partner organizations to develop behavior change toolkits.

EQUITY & INCLUSION

Dane County LWRD believes that everyone deserves to live in a community with healthy land and water resources as well as with access to the parks, trails, and other land and water resources in the county. The LWRD ensures policies and practices promote equitable access to these resources, and the jobs, opportunities, and programs. Dane County has made progress, but some groups continue to face more barriers than others and more work needs to be done towards these goals.

In 2017, an equity and inclusion plan was developed and submitted to the Dane County Office of Equity and Inclusion. This plan will help increase the understanding of equity issues and how LWRD can be a constructive part of a more equitable and inclusive department and county. The plan includes actions and ideas to increase the diversity of the workforce as well as identify and remove barriers so that all county residents have equal access to programs and services. This plan builds on equity initiatives already underway. A few examples include:

- Youth Apprenticeship and Career Pathways Program - expanding the diversity of youth exposed to parks-related careers.
- Interactive Watershed Model at Henry Vilas Zoo - providing information in Spanish and Hmong at this new exhibit.
- Free Native Plants Program - reducing financial barriers so schools and communities can install natural spaces.

The department is also working to support the natural resources committees and commissions within the county that are working on equity and inclusion goals. For example, the Lakes and Watershed Commission adopted its own equity and inclusion commitment statement in January 2017, and other natural resources committees and commissions are starting to do the same.

In 2017, LWRD hosted student writers from the Simpson Street Free Press, a nonprofit newspaper and youth center that teaches critical thinking and writing skills in hopes of bridging Madison's achievement gap. The students wrote a number of articles highlighting Dane County parks, conservation careers, water volunteer efforts, and many other articles that helped us spread our message far and wide in the county. A few of these articles were also translated into Spanish.

STRATEGIC IMPLEMENTATION

To ensure successful achievement of the agricultural performance standards and prohibitions, the following phased approach for prioritizing, implementing, and verifying conservation practices is the primary mechanism for the LWRD to accomplish many of the implementation goals in this plan. This procedure ensures execution efficiencies while promoting a systems approach, which encourages the implementation and management of multiple practices that work together, to address resource concerns, conservation needs, and compliance with the agricultural performance standards and prohibitions. The LWRD intends to use this three-phased implementation strategy to maximize resource efficiency with a goal of being program agnostic when working with landowners on implementation of practices and delivery of conservation services.

PHASE 1: WATERSHED EVALUATION, PRIORITIZATION & INVENTORY

This phase of the strategic implementation strategy can be divided into three main steps for assessment work: evaluation, prioritization and inventory. The need to conduct this phase of the implementation strategy may be a result of program priorities, local priorities, funding opportunities, or resource concerns, etc. The detail to which this work is completed is heavily influenced by the resources available such as time, staff and funding. However, when possible, the following steps will be completed with the resources available:

- **Evaluation:** Using available information such as existing water quality data, TMDLs, and past modeling efforts, watershed can be evaluated to identify priorities and goals based on the resource concerns being assessed.

- **Prioritization:** Prioritization further narrows the scope of where to focus resources and implementation efforts, particularly with broad TMDLs. As needed, additional modeling can be used to further refine the data and goals. For most projects, the priority area is at roughly a hydrologic unit code (HUC) 12 watershed scale. This size is more manageable for targeting resources, tracking implementation and reporting progress.

- **Inventory:** Once a HUC-12 watershed has been selected as a priority area, a further evaluation is conducted to identify sub areas (sub-HUC-12's) to further identify higher contributing areas based on resource concerns. County staff then use their knowledge of the watershed in conjunction with evaluation tools (i.e. air photos, conservation plans, etc.) to identify and inventory known resource concerns. Staff also identify and contact current landowners to aid in the following conservation planning process. This inventory is documented so that progress can be tracked towards the implementation goals.

PHASE 2: IMPLEMENTATION & TRACKING

Once a priority area has been identified based on the assessment process in Phase 1, the implementation and tracking for Phase 2 begins. Implementation of conservation practices involves staff working directly with landowners to identify resource concerns and assist with the planning, design and construction of conservation practices to address resource concerns. To complete this work, staff follow a nine-step conservation planning process in partnership with the landowner which is outlined in Figure 19.

Tracking typically includes evaluating and documenting the benefit of the conservation practice on the resource as well as compliance with the agricultural performance standards and prohibitions; so it may focus on metrics that are measurable (i.e. tolerable soil loss, water quality data, nutrient reductions, etc.) Figure 20 is an example of some of the models and tools used to calculate metrics for phosphorus reductions for various practices. Practices are typically organized into three main categories:

- **Management "Soft" Practices:** This category includes a variety of agricultural management practices used to address nutrient and sediment loss typically from cropped fields such as nutrient management planning, crop rotations, changes in tillage, and cover crops. Soft practices refer to the fact that these practices are planned and implemented on land with changing management needs or may be limited in timing.
- **Structural "Hard" Practices:** This category includes a variety of agricultural management practices used to address nutrient and sediment loss from cropped fields and production sites. These may include grassed waterways, terraces, manure storage, or barnyard runoff controls. Hard practices refer to the fact that these practices require elements of engineering, design, construction and installation of permanent structures.
- **Innovative Practices:** This category can include a variety of new or innovative practices to be used as part of the management of cropped fields or livestock production sites that are not traditionally utilized or do

not have technical standards. This may include harvestable buffers, easements, or alternative manure treatment system.

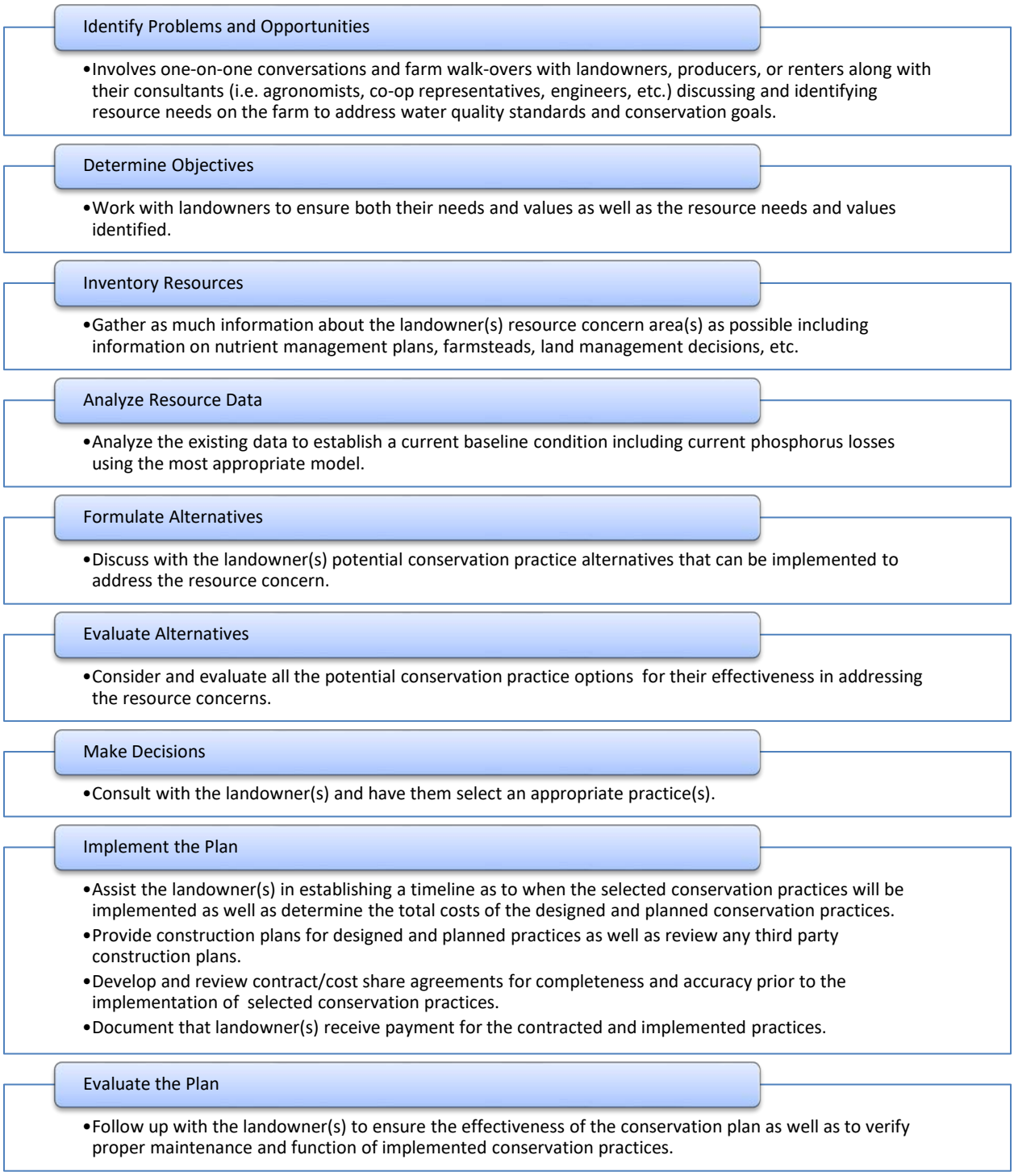


Figure 19: Nine-Step Conservation Planning Process

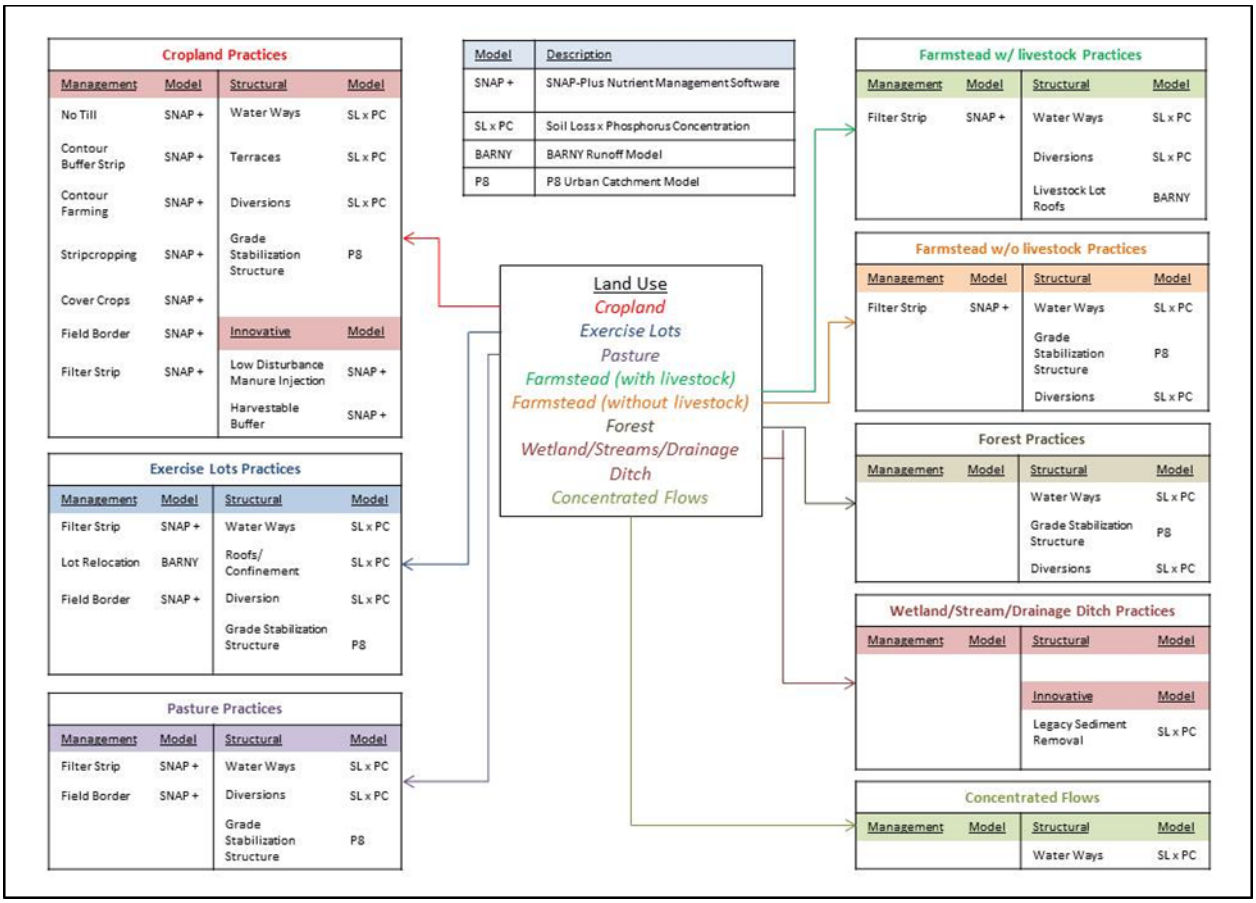


Figure 20: Example Models for Calculating Phosphorus Reductions

PHASE 3: VERIFICATION & REPORTING

Verification of conservation systems is important to ensure continued operation and maintenance through the life of practices in the system as well as continued compliance with the agricultural performance standards and prohibitions. Verification includes reviewing all applicable practices associated with an implemented conservation system and may include reviewing the conservation plan, nutrient management plan, operation/maintenance plans, cropland practices, and production site practices. In order to manage workload between implementing new practices and verifying existing and previously installed conservation practices, the following items will be considered:

- Status reviews will be conducted on a four year rotation by township.
    - **Year 1:** Cottage Grove, Windsor, Burke, Rutland, Mazomanie, Oregon, York, Fitchburg, Dunn, Dunkirk
    - **Year 2:** Middleton, Blue Mounds, Blooming Grove, Medina, Albion, Berry, Vermont, Verona, Perry
    - **Year 3:** Pleasant Springs, Springfield, Vienna, Deerfield, Montrose, Roxbury
    - **Year 4:** Westport, Cross Plains, Dane, Sun Prairie, Christiana, Black Earth, Springdale, Primrose, Bristol, Madison

- Status reviews may result in the need to address maintenance and repair concerns for already installed practices. These situations will be evaluated and addressed as they are discovered.

- While conducting status reviews, new resource concerns, practices, and/or landowners may be identified to participate in adaptive management and added to existing inventory work to be incorporated into future work planning.

As part of each status review, the steps outlined in Figure 21 are used to ensure that the process of review, documentation and follow-up remains consistent.

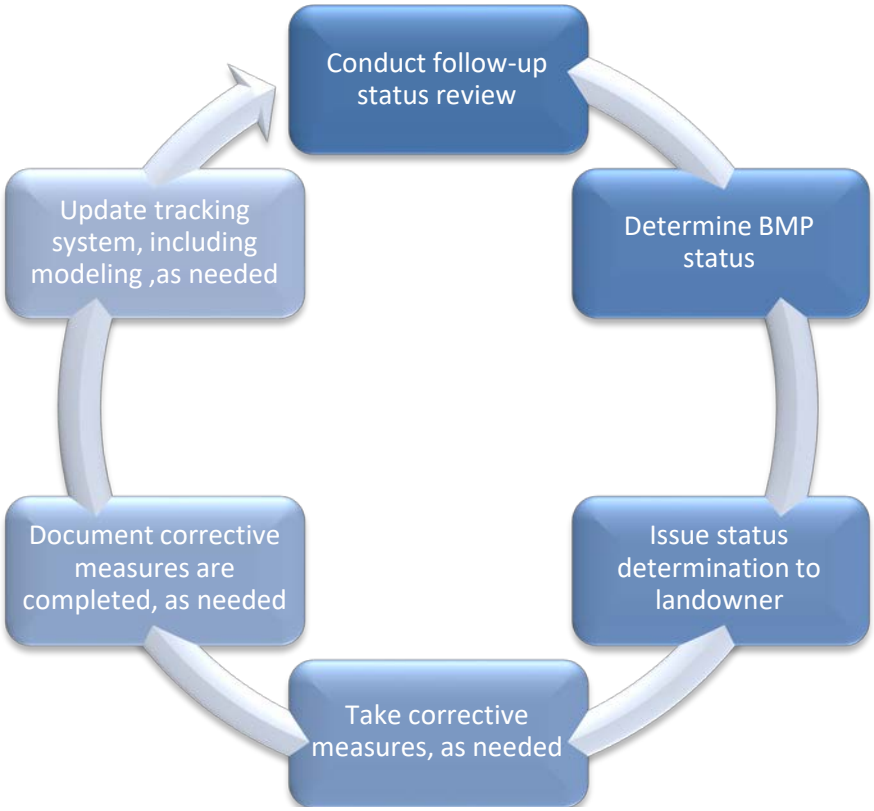


Figure 21: Practice Verification Process

Records and data for the practices, contracts, and modeled reductions implemented and managed through county programs are maintained spatially using geographic information systems (GIS) as well as local databases. Periodically this data is reviewed for quality control to ensure the accuracy of the collected information as this information is used to develop reports, monitor progress and build work plans. Many metrics are tracked and can be used to aid in the other steps and phases of the implementation strategy. Some metrics include, but are not limited to:

- Number of landowners/operators contacted,
- Number of cost-share agreements signed,
- Planned and completed conservation practices,
- Pollutant load reductions and percent of goal planned and achieved,
- Numbers of verification checks to be completed,
- Status of nutrient management planning, and easement acquisition and development,
- Total amount of money on cost-share agreements, and
- Total amount of landowner reimbursements made.

Reporting on the above metrics, load reductions, compliance with the agricultural performance standards and prohibitions, and general County implementation progress will occur on an annual basis. Given the many unknowns that are associated with implementing conservation practices (i.e. willingness of landowner, commodity prices, weather, land tenure, etc.), this robust approach in measuring progress will ensure that decisions related to modifying the implementation plan will be vetted and appropriately adopted.

PARTNERSHIPS

To accomplish the goals and objectives of this plan, the LWRD partners with a number of different entities, including: land and water conservation organizations, parks friends groups, colleges and universities, DNR, DATCP, UWEX, NRCS, Farm Service Agency (FSA), local municipalities, and many other individuals and organizations. A few project specific partnerships include:

- **Yahara Watershed Improvement Network (WINS):** An initiative to achieve clean water goals for the Yahara Watershed. In this effort, community partners led by Madison Metropolitan Sewerage District are collaborating on a strategy called watershed adaptive management to address TSS and phosphorus reductions.
- **Wisconsin Salt Wise:** A coalition of organizations working together to reduce salt pollution in local lakes, streams and drinking water.
- **Madison Area Municipal Storm Water Partnership (MAMSWaP):** A joint permit and coalition between 21 municipalities to comply with stormwater discharge regulations.

CONSERVATION PRACTICES

The implementation of conservation practices by landowners occurs for many reasons ranging from addressing resource concerns; to compliance with performance standards, prohibitions and programs; to enhancing biological habitats. LWRD staff work with landowners to select the practice(s) best suited for the identified conservation need. Practices that have NRCS Technical Standards are planned, designed and implemented according to the NRCS Field Office Technical Guide for Wisconsin.

Innovative practices that do not have an NRCS Technical Standard are planned, designed, and implanted according to established program/practice guidelines or agreements. Long-term maintenance plans are also prepared for the landowner to ensure that installed practices are properly maintained and function as intended for the life expectancy of the practice or agreement. Figure 22 highlights current innovative practices being utilized by the county within the Yahara River and Badfish Creek Watersheds.

Harvestable Buffers

- A harvestable buffer, or field border, is a strip of grass that can be harvested and utilized while also providing an environmental benefit by capturing sediment, nutrients and pesticides.
- These buffers can consist of either cool-season or native prairie grass mixes.
- Through the Yahara CLEAN Program, landowners have the option of establishing a buffer with a perennial grass cover for a contract period of five, ten or fifteen years.

Low Disturbance Manure Injection

- Low disturbance manure injection (LDMI) systems cut through residue, lift the soil, and inject nutrients.
- These systems create very little soil disturbance, are compatible with no-till planting, and allow producers/landowners to apply manure in a manner that reduces the risk of runoff and maintains residue on cropped fields.

Figure 22: Examples of Innovative Practices

FUNDING OPPORTUNITIES

The LWRD utilizes multiple programs to help implement conservation initiatives in Dane County at the local, state, and federal level. Service recipients and projects are evaluated on their overall conservation needs by the LWRD staff. The merits of each program are discussed with the landowner or partner prior to entering into a formal agreement. Table 8 provides a brief overview of Dane County's main conservation programs and funding sources while Table 9 highlights funds spent over the past ten years.

Table 8: Conservation Programs & Funding Sources

Funding Source	Program Name	Eligibility Location	Description
Federal-USDA	Environmental Quality Incentive Program (EQIP)	Countywide	One time cost share rate based on practices
Federal-USDA	Conservation Reserve Program (CRP)	Countywide	Annual payment based on soil rental rate and cost share available for establishment
Federal-USDA	Conservation Reserve Program Grasslands (CRP-Grasslands)	Countywide	Annual payment and cost share available for establishment
Federal-USDA	Agricultural Conservation Easement Program (ACEP)	Countywide	Agricultural land easements and wetland reserve easements
Federal-USDA & State	Conservation Reserve Enhancement Program (CREP)	Countywide	Annual payment based on soil rental rate and cost share available for establishment
State DATCP	Soil & Water Resource Management (SWRM)	Countywide	Funds to pay 70-90% of engineered practices installed, implementation of nutrient management plans, and LCD staff
State DATCP	Nutrient Management Farmer Education	Countywide	Grant to reimburse producers for completing training on how to create their own nutrient management plan
State WDNR	Targeted Resource Management (TRM) Grants	Countywide	Funds to pay up to 70-90% of engineered practices installed
State WDNR or DATCP	Notice of Discharge/Intent (NOD) Grants	Countywide	Funds to pay up to 70-90% of engineered practices installed
Dane County	Land and Water Legacy	Countywide	Cost share funds available to agricultural producers to implement conservation practices
Dane County	Yahara CLEAN	Within the Yahara and/or Badfish Creek Watersheds	Funds to pay 70-90% of engineered practices installed

Funding Source	Program Name	Eligibility Location	Description
Dane County	Urban Water Quality Grant (UWQG)	Countywide	Cost share funds available to municipalities to improve and retrofit storm water outlets
Dane County	Easements	Countywide	Funds to create Dane County conservation related easements
Madison Metro Sewerage District	Yahara WINS	Yahara and Badfish Creek Watersheds	Funding for implementing phosphorus reducing conservation practices

Additional funding opportunities are utilized to accomplish other goals and objectives to address conservation, preservation and educational efforts. Examples of these programs include, but are not limited to:

- Dane County PARC & Ride Grant Program – provides matching grants for designing and constructing new shared-use trails as identified in the Dane County POSP.
- Dane County Conservation Fund – provides grants to non-profit organizations and local governmental units for the purchase of land or land interests identified in the Dane County POSP.
- DNR Surface Water Grants – includes grants programs for aquatic invasive species prevention and control, lake classification and lake protection, and river protection planning and river protection management.
- DNR Urban Forestry Grants – provides funding to improve capacity to manage trees and projects to conserve, protect, expand or improve urban forest resources.

OTHER LOCAL INITATIVES

In addition to state and federal programs the LWRD provides implementation assistance to, there are a number of local initiatives and priorities that focus work the department does. The following is a brief summary of current initiatives:

- **Legacy Sediment Removal Project:** This county-funded initiative is looking at removing a build-up of legacy stream sediments formed by erosion from farm fields accumulating over decades of farming in order to reduce the concentrations of phosphorous in the streams that feed into the Yahara Lakes. It is anticipated that the project will also assist in restoring original gravel stream beds to allow for the regeneration of fish populations. Over 30 miles of streams have been identified as potential sites for assessment to determine sediment removal options.
- **Alternative Manure Management Options:** The County has been exploring new ways to support agriculture with manage manure through the use of technology and other options. In 2009, the Community Manure Feasibility Study Committee reviewed feasibility options regarding various technologies, nutrient management, economics and financing conditions, environmental and bio-security requirements, ownership and management options and other relevant issues. This work led to two community anaerobic digesters, one in the Waunakee area and one in the Middleton area. Plans are underway for a nutrient reduction system to be installed at the Middleton digester that will have a WPDES permit to discharge treated water. Additional efforts are underway to explore new digesters, composting and biogas collection.

Table 9: Funding for Conservation Practices, 2008 - 2017

GRANT	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DANE COUNTY SUPPLEMENTAL	$151,749	$36,075	$44,302	$163,980	$379,534	$415,563				
CHAPTER 14 IMPLEMENTATION	$10,680	$28,052		$73,513	$44,650					
YAHARA CLEAN (PRACTICES)					$43,215	$177,826	$72,077	$480,826	$348,223	$165,254
HARVESTABLE BUFFERS (CLEAN)							$40,541	$249,888	$124,094	$182,597
LOW DISTURBANCE MANURE INJECTIONS (CLEAN)										$18,598
YAHARA-MENDOTA PWP (2001-2009) *YAHARA WATERSHED, LEGACY FUNDS (2010 +)*	$91,161	$175,649			$62,295					
EQIP	$577,237	$409,721	$232,695	$713,106	$940,268	$511,599	$648,303	$396,143	$276,373	$268,761
USDA FISH & WILDLIFE SERVICE	$15,000	$32,500	$25,200	$26,359	$20,452	$40,585				
USDA WILDLIFE DAMAGE PROGRAM (APHIS)		$43,849	$43,727	$30,510	$46,630	$27,238	$42,657	$49,713	$32,024	$28,778
NUTRIENT MANAGEMENT FARMER EDUCATION (MALWEG)		$6,500		$6,000	$6,000	$6,000	$7,000	$7,000	$5,500	$4,500
SOIL & WATER RESOURCE MANAGEMENT GRANT (LWRM – PRACTICES)	$60,885	$51,372	$52,019	$59,455	$44,150	$51,786	$53,108	$40,400	$26,668	$60,536
SOIL & WATER RESOURCE MANAGEMENT GRANT (SWRM – NUTRIENT MANAGEMENT)	$42,647	$91,431	$30,156	$25,665	$21,633	$22,089	$28,721	$42,408	$66,118	$46,790
DNR TARGETED RUNOFF MANAGEMENT GRANT	$92,620	$99,437	$42,000	$257,605	$54,733					
DNR CONSERVATION AIDS PROGRAM	$30,000	$8,088	$9,072	$2,940	$14,375	$3,200				
THE NATURE CONSERVANCY			$18,572	$37,937	$36,403					
TOTAL	**$1,071,979**	**$982,674**	**$497,743**	**$1,397,069**	**$1,714,337**	**$1,255,885**	**$892,406**	**$1,266,377**	**$879,000**	**$775,813**

[1]EQIP- Based on Fiscal Year (Oct. 1 - Sept. 30) of each year

[2]Chap. ATCP 50, Wis. Adm. Code, outlines Wisconsin's Soil and Water Resource Management Program.

Note: Figures do not include the landowner's share of the cost of installed practices, which averages 25% to 30% of total cost. The Dane County Land Conservation Committee, the USDA Farm Service Agency (FSA) and USDA Natural Resources Conservation Service administer cost-sharing grants.

Source: Dane County Land Conservation Department, July 2018

- **Healthy Farms, Healthy Lakes Taskforce:** In 2017, Dane County Board created a taskforce to develop recommendations to address phosphorous reductions to surface waters. The final report came out in late 2018 and is found in Appendix F. Many of the recommendations are also incorporated into the goals and objectives of this plan as well.
- **Point Source Phosphorous Compliance Options:** A number of the Wisconsin Pollutant Discharge Elimination System (WPDES) permitted communities in Dane County are exploring alternative phosphorous compliance options for their discharges including water quality trading and adaptive management. These options allow the point source to offset or reduce their pollution load by reducing sources of phosphorous within specified watersheds. Currently, the County has entered into a service agreement with the Yahara WINS adaptive management effort led by Madison Metropolitan Sewerage District and had provided letters of support for the Dane-Iowa wastewater treatment facility, Deerfield wastewater treatment facility, and Blue Mounds wastewater treatment facility phosphorous compliance options. Staff have also met with a number of other communities exploring adaptive management or water quality trading.

SUMMARY

The LWRD relies on numerous tools and resources to accomplish the goals, objectives and actions of the management plan. Focusing on building capacity within the community through education, partnerships, and inclusion is an important method for addressing resource concerns and building awareness of the importance of the soil and water resources throughout the county.

CHAPTER 7: MONITORING & EVALUATION

A comprehensive measurement system that shows whether conservation efforts are making a difference is essential to any conservation program. When evaluating a specific project or program, a system of qualitative and quantitative measurements should be used to determine a project or program's value and effectiveness. Such evaluations need to take into account a variety of factors, including customer needs, protection or enhancement of the resource, regulatory requirements, and fiscal responsibility. The LWRD monitors its programs in a number of different ways. Due to the Department's vast array of program responsibilities, only a few monitoring protocols will be discussed here.

SOIL RESOURCES

Maintaining soil resources in their place is important for productive working lands as well as protecting water resources. Monitoring and evaluating soil erosion and health aids in targeting and focusing conservation efforts and involves input and participation from a variety of partners and stakeholders.

TOLERABLE SOIL LOSS

In order to monitor soil erosion, the LWRD will continue to build on the nutrient management implementation data being collected to analyze tolerable soil loss. This data will then be used to evaluate trends and assist with targeting future programs and resources to areas that need to be addressed. Exploring ways to monitor and evaluate soil health will also be incorporated into the workflow for addressing soil resource concerns.

TRANSECT SURVEY

The data collected through monitoring nutrient management implementation will complement the data collected through the annual transect survey. The LWRD conducts transect surveys each year in the spring. Residue measurements are taken and compared to the previous years' data. The survey evaluates changes in crop rotation and crop residue management systems, as well as other supporting conservation practices such as contour farming and contour strip cropping. The survey covers 410 linear miles and originally included 1,146 data points in 1994. In 1999, there were 1,122 data collection points, 1,095 data collection points in 2002, 1,054 data collection points in 2007, and 1,035 in 2018. Figure 23 shows the locations of the data collection points and route through the county. The net loss of data collection points is a result of converting annually cropped fields to non-cropland uses.

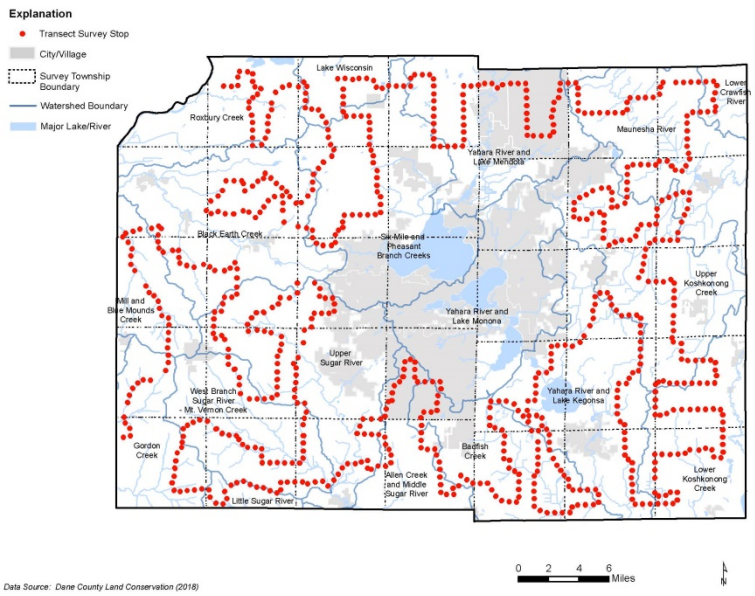


Figure 23: Transect Survey Route & Data Points

EMERGING MONITORING

The soil health movement is taking hold throughout the state and Dane County is exploring options to build soil health into current programming, messaging, monitoring and evaluation. In addition, through the Healthy Farms, Healthy Lakes Taskforce, recommendations were made to monitor soil phosphorous levels and expand evaluations for the phosphorus index.

Large-scale watershed modeling (i.e. SWAT, EVAAL, SLAMM, etc.) can also be used to evaluate responses by the system to practices on the landscape. While the LWRD has not been the lead on historical modeling efforts (i.e. TMDLs, Yahara WINS, etc.), data collected by the department has been used to help feed these modeling efforts. Additional modeling may be incorporated into the monitoring program going forward.

Through the course of implementing this plan, these items will be explored and the county anticipates other partners and stakeholders may take lead roles in assisting with evaluation of these types of parameters.

WATER RESOURCES

Dane County partners with a variety of organizations to support monitoring the water resources throughout the county. Partnering allows for resources to be pooled together to collect the best data at the appropriate times. A few programs are highlighted regarding monitoring supported by the county. The collective data can be used to determine water quality trends and help target implementation resources to areas of water quality concern or need for protection.

WATER QUALITY MONITORING STATIONS

Various water quality monitoring stations are located throughout Dane County. Dane County also participates in a Cooperative Water Resources Monitoring Program, which is coordinated by the CARPC in conjunction with local units of government. This program monitors baseflow water quality in representative streams throughout the county and storm flow in the Yahara River system and in the major tributaries to Lake Mendota. These monitoring stations are maintained by the United States Geological Survey (USGS) for the purpose of determining long-term trends in surface water quality. They provide valuable information for planning, evaluation, and calibrating water quality models. Staff can also use the data

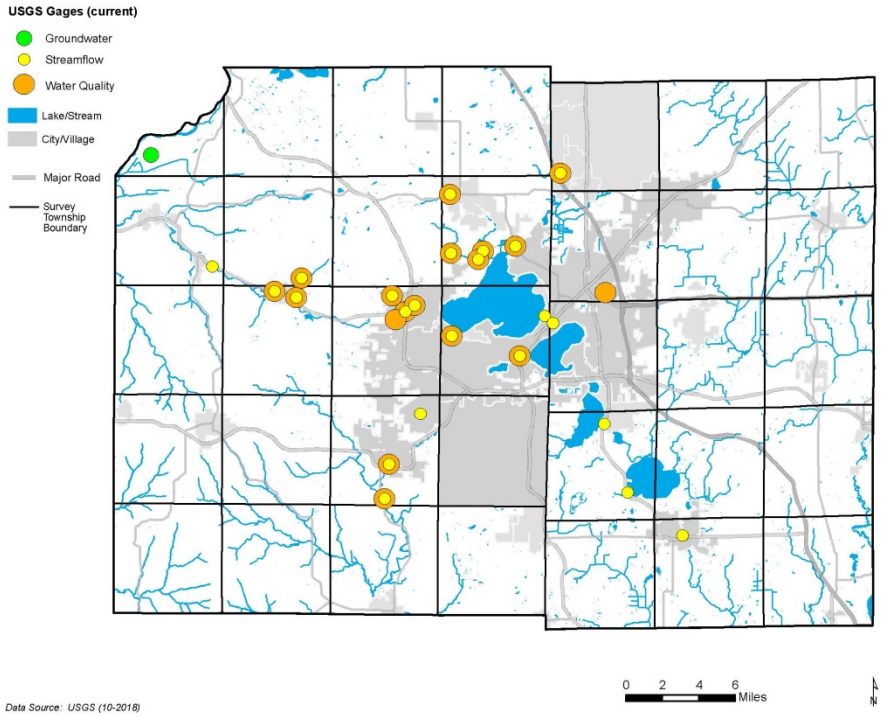


Figure 24: USGS Gauging Stations, Dane County

to determine the effects land use changes are having on water quality. Water quality data can be used to qualify the effects certain management practices are having if they are properly maintained. Figure 24 shows locations of the USGS gauging stations with long-term records in Dane County.

CITIZEN MONITORING PROGRAM

Dane County supports citizen stream monitoring efforts, including training events, in the county as needed. Groups overseeing monitoring volunteers include the Rock River Coalition and Upper Sugar River Watershed Association. Volunteers take measurements of dissolved oxygen, temperature, water clarity, water flow, and habitat. Volunteers also collect samples of the aquatic insects that live in rocky areas, under banks, and in the aquatic vegetation of the stream, and calculate the biotic index of the stream which is an indicator of stream health.

This data is entered into the DNR's Surface Water Integrated Monitoring System (SWIMS) statewide database. This information is then used to build a baseline inventory of stream conditions and is considered to be a valuable tool for resource managers and provides important baseline and trend data.

PRACTICE IMPLEMENTATION & VERIFICATION

There are a number of ways LWRD monitors and evaluates the implementation and maintenance of conservation practices through time. Status reviews, practice verification, and spot checks are the primary ways. As the LWRD works to develop new tracking and database management systems, additional methods may be developed going forward.

STATUS REVIEWS

To ensure compliance with various requirements and programs, the LWRD conducts status reviews on a regular basis. A variety of methods are used to determine which landowners and practices will be reviewed on an annual basis. The overarching process for verification is described in Chapter 4 as part of the strategic implementation strategy the LWRD uses for implementation. Some of the primary examples of how this process in incorporated include:

- **Farmland Preservation Program (FPP):** There are approximately 1,200 FPP participants in the county. The program requires status reviews to be conducted for compliance purposes once every four years. In order to conduct these reviews, 25% (or roughly 300) of the participants are reviewed annually.
- **Agricultural Performance Standards & Prohibitions:** Depending on the number of complaints received or active projects, the number of status reviews for compliance with the agricultural performance standards and prohibitions varies from year to year. These reviews are conducted as needed and are documented in accordance with the procedures outlined in ch. NR 151, Wis. Adm. Code.
- **Federal Programming:** Dane County has an operational agreement with NRCS for general programming associated primarily with EQIP and conservation planning. The County also has a cooperator agreement for conducting specific work associated with the CRP and CREP programs. NRCS or FSA select program participants annually for compliance reviews. Staff provide assistance with these reviews as necessary.
- **Permits:** All manure storage permits issued by the LWRD are reviewed during the construction process and verified at the end of construction. Winter spreading permits issued by the LWRD are reviewed once every four years (similar to FPP). Annually approximately 25% of the permittees are reviewed.
- **Erosion Control and Storm Water Inspections:** Inspections are done regularly to oversee the erosion control and storm water management permits issued or implemented as part of agreements with local municipalities (Figure 25).

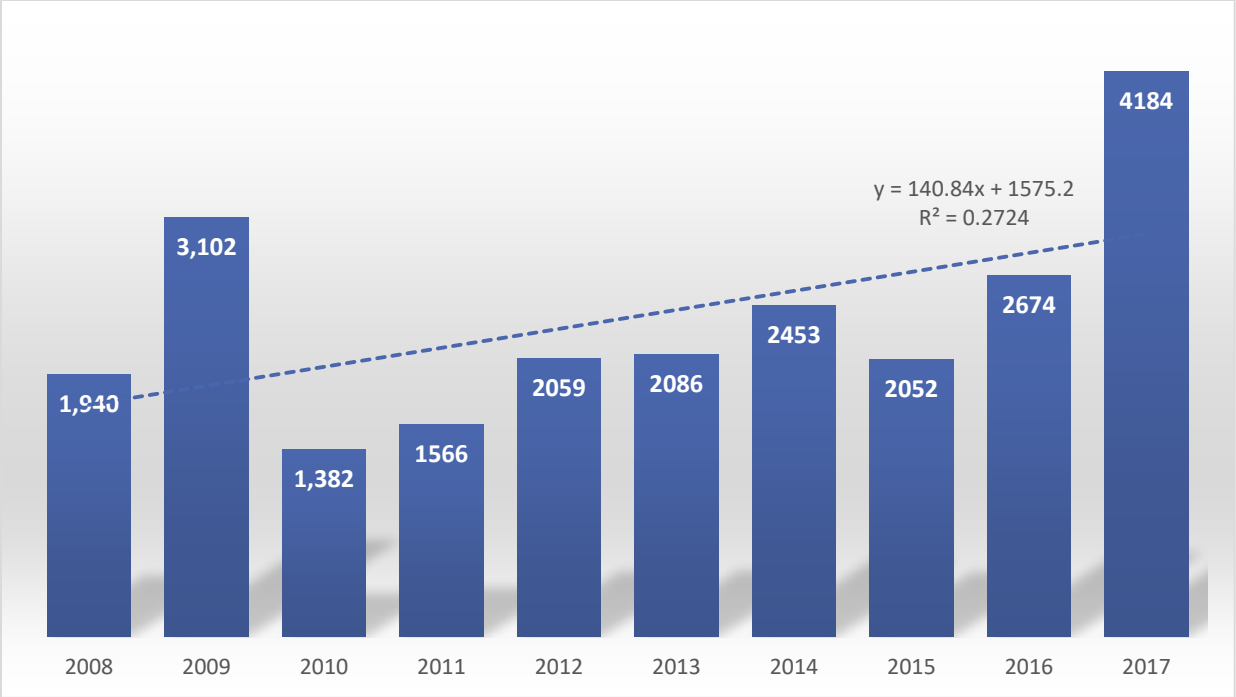


Figure 25: Erosion Control Storm Water Management Inspections, 2008 - 2017

AUDITS

Other agencies LWRD partners with on programming will, at times, conduct reviews or audits of the work done by staff. This ensures consistency with required job authorities and paperwork documentation. Examples include:

- **Spot Checks:** Annually, NRCS and DATCP conduct engineering and conservation planning spot checks on the work performed by staff the previous year. These checks provide quality control of both planning and technical design work.
- **Audits:** DNR, DATCP and Dane County conduct audits of many of the nonpoint source projects conducted by the county. Program administration and financial audits ensure quality from an administrative perspective. In many cases, these audits are required by law and will continue to be an important self-evaluation tool.

ANNUAL REPORTING

The LWRD compiles a number of reports to summarize and evaluate the work that has been done over the previous years. Examples of these reports include:

- **Land & Water Resources Department Annual Report:** This report is developed annually and includes updates on soil and water resource programs, achievements, statistics, and Department highlights. Past reports are available on the LWRD website.
- **DATCP Annual Reporting:** As part of the soil and water resource management grant the county receives, annual reports are submitted to DATCP. These reports are then compiled to create a state-wide report. The LWRD receives copies of this report to share with elected officials, interested stakeholders, partnering organizations and the public. These reports are available on DATCP's website.

- **Program Specific Reporting:** The LWRD is asked to participate in a number of initiatives, grants, partnerships, and programming which typically require a level of reporting consistent with the needs of the program. Examples of reports currently being developed include annual reports to Yahara WINS for work done on the adaptive management project in accordance with a service agreement as well as reporting to NRCS for the Yahara Resource Conservation Partnership Program project. Examples of these reports are available on the LWRD website.

SUMMARY

Monitoring and evaluation are important factors when determining if goals, objectives and actions are being met. Being able to track accomplishments and report on findings and trends provides a pictures of progress, may identify barriers and can be used to help direct resources to areas needing attention.

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APPENDIX A: AGRICULTURAL & URBAN TRENDS

Table 10: Farm Operations

	2006	2012
Number of Farm Operations	2,595	2,749
Acres of Land in Farm Operations	512,971	505,420
Acres per Farm Operation	198	183

Source: USDA – NASS

Table 11: Harvested Crop Data

	2006			2016		
	Acres	***Bushels/Acre***	***Bushels***	***Acres***	***Bushels/Acre***	***Bushels***
Corn for Grain	157,000	172.2	27,040,000	176,500	192.5	33,982,000
Corn for Silage	28,600	24.2	692,000	*45,600	*25	*1,129,000
Soybeans	80,600	52.2	4,210,000	80,400	60.4	4,855,000
Oats	4,300	78.8	339,000	1,090	68.3	74,500
Wheat	11,900	87.6	1,042,000	13,600	88.7	1,206,000
Alfalfa	71,900	4.3	310,000	25,200	3.7	92,900

* 2015 values, 2016 values were not available

Source: USDA – NASS

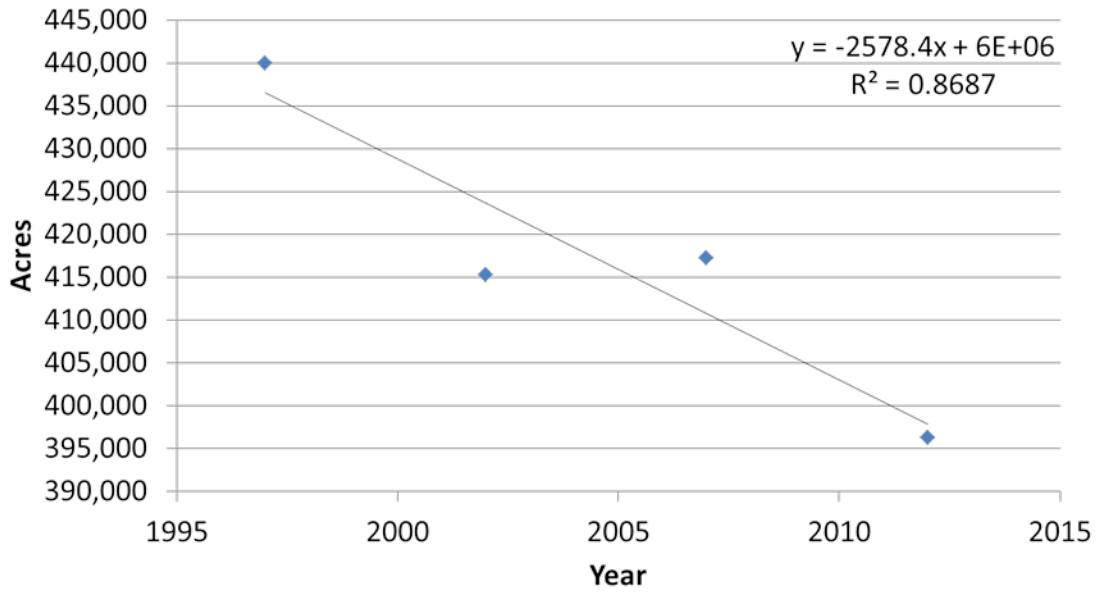
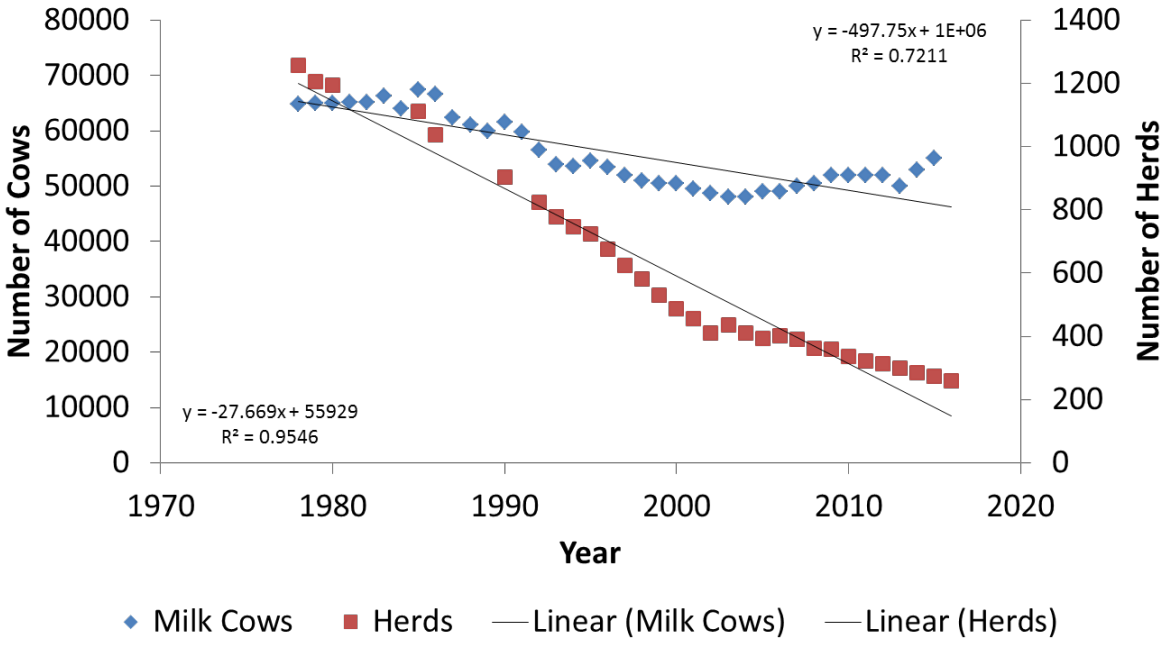
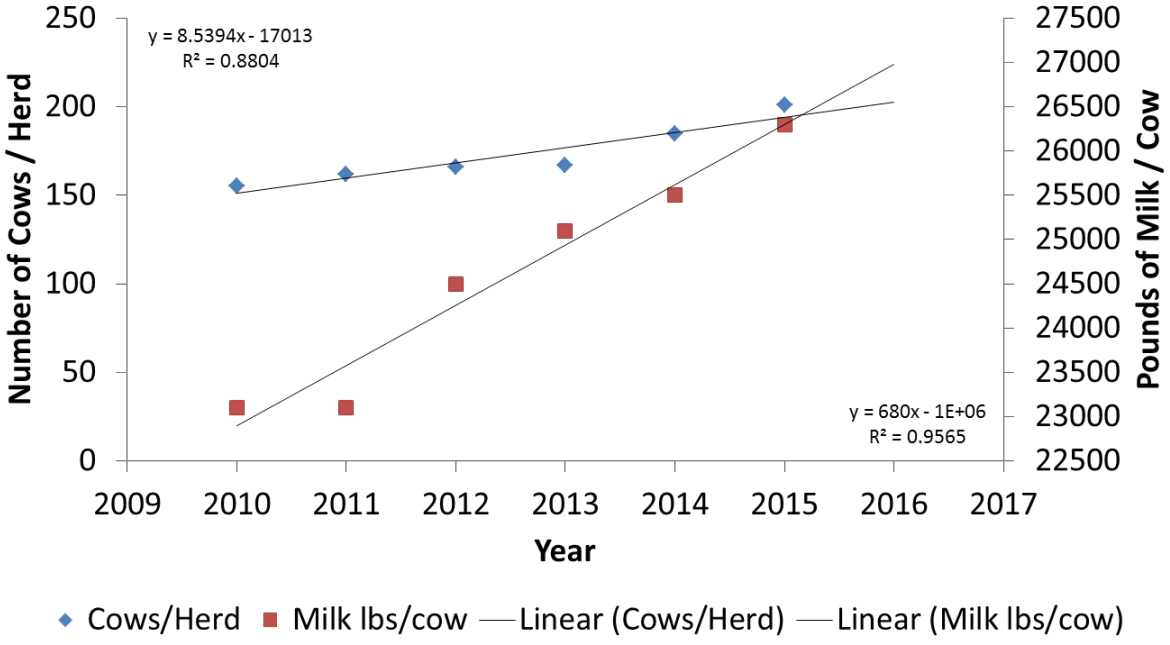


Figure 26: Cropland Acre Trends



Source: USDA – NASS

Figure 27: Trends for Milk Cows & Herds



Source: USDA – NASS

Figure 28: Cows/Herd & Milk Production Trends

Table 12: Land Disturbing Activities, 2008 - 2017

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
ECSM Plan Reviews	1026	879	799	771	775	676	681	656	648	958
ECSM Permits	474	460	460	403	438	404	389	384	326	387
ECSM Site Inspections	4184	2674	2052	2453	2086	2059	1566	1,382	3,102	1,940

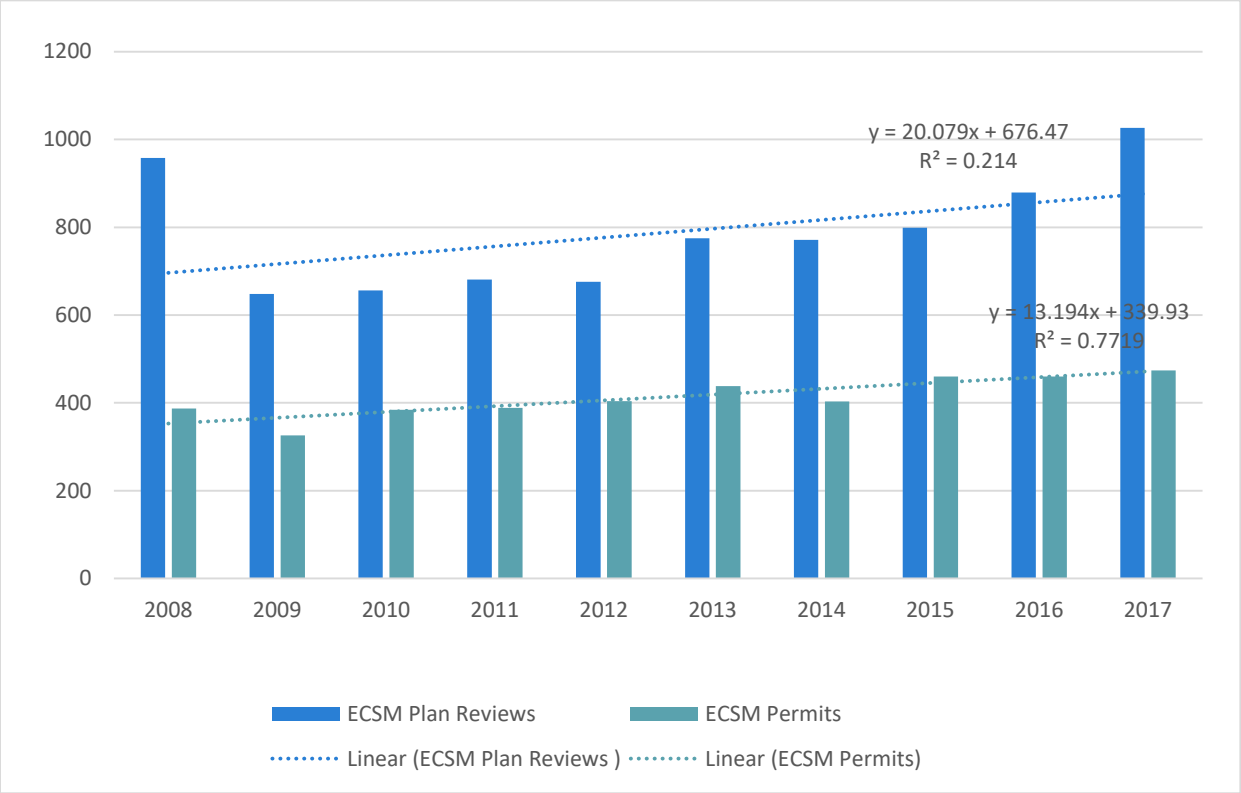


Figure 29: Erosion Control, Storm Water Management Plan Reviews and Permits Issued, 2008 – 2017

APPENDIX B: ENDANGERED/THREATENED SPECIES IN DANE COUNTY

Scientific Name	Common Name	Status		Group
		*WI**	*Federal***	
Acris blanchardi	Blanchard's Cricket Frog	END		Rare Amphibians
Lithobates palustris	Pickerel Frog	SC/H		Rare Amphibians
Bombus affinis	Rusty-patched Bumble Bee	SC/FL	LE	Rare Ants, Wasps, and Bees
Cicindela patruela patruela	Northern Barrens Tiger Beetle	SC/N		Rare Beetles
Ellipsoptera lepida	Ghost Tiger Beetle	SC/N		Rare Beetles
Ellipsoptera macra	Sandy Stream Tiger Beetle	SC/N		Rare Beetles
Lioporeus triangularis	A Predaceous Diving Beetle	SC/N		Rare Beetles
Ammodramus henslowii	Henslow's Sparrow	THR	SOC	Rare Birds
Asio otus	Long-eared Owl	SC/M		Rare Birds
Bartramia longicauda	Upland Sandpiper	THR		Rare Birds
Botaurus lentiginosus	American Bittern	SC/M		Rare Birds
Buteo lineatus	Red-shouldered Hawk	THR		Rare Birds
Chlidonias niger	Black Tern	END	SOC	Rare Birds
Chondestes grammacus	Lark Sparrow	SC/M		Rare Birds
Colinus virginianus	Northern Bobwhite	SC/M		Rare Birds
Empidonax virescens	Acadian Flycatcher	THR		Rare Birds
Falco peregrinus	Peregrine Falcon	END		Rare Birds
Geothlypis formosa	Kentucky Warbler	THR		Rare Birds
Icteria virens	Yellow-breasted Chat	SC/M		Rare Birds
Ixobrychus exilis	Least Bittern	SC/M		Rare Birds
Lanius ludovicianus	Loggerhead Shrike	END	SOC	Rare Birds
Nycticorax nycticorax	Black-crowned Night-Heron	SC/M		Rare Birds
Progne subis	Purple Martin	SC/M		Rare Birds
Rallus elegans	King Rail	SC/M		Rare Birds
Setophaga cerulea	Cerulean Warbler	THR	SOC	Rare Birds
Setophaga citrina	Hooded Warbler	THR		Rare Birds
Sturnella neglecta	Western Meadowlark	SC/M		Rare Birds
Vireo bellii	Bell's Vireo	THR		Rare Birds
Catocala abbreviatella	Abbreviated Underwing Moth	SC/N		Rare Butterflies and Moths
Catocala whitneyi	Whitney's Underwing Moth	SC/N		Rare Butterflies and Moths
Erynnis lucilius	Columbine Dusky Wing	SC/N		Rare Butterflies and Moths
Erynnis martialis	Mottled Dusky Wing	SC/N		Rare Butterflies and Moths

Scientific Name	Common Name	Status		Group
Grammia phyllira	Phyllira Tiger Moth	SC/N		Rare Butterflies and Moths
Hesperia ottoe	Ottoe Skipper	END		Rare Butterflies and Moths
Papaipema silphii	Silphium Borer Moth	END		Rare Butterflies and Moths
Schinia lucens	Leadplant Flower Moth	SC/N		Rare Butterflies and Moths
Speyeria idalia	Regal Fritillary	END	SOC	Rare Butterflies and Moths
Argia plana	Springwater Dancer	SC/N		Rare Dragonflies and Damselflies
Epiaeschna heros	Swamp Darner	SC/N		Rare Dragonflies and Damselflies
Acipenser fulvescens	Lake Sturgeon	SC/H		Rare Fishes
Anguilla rostrata	American Eel	SC/N		Rare Fishes
Crystallaria asprella	Crystal Darter	END	SOC	Rare Fishes
Cycleptus elongatus	Blue Sucker	THR		Rare Fishes
Erimyzon sucetta	Lake Chubsucker	SC/N		Rare Fishes
Etheostoma asprigene	Mud Darter	SC/N		Rare Fishes
Etheostoma microperca	Least Darter	SC/N		Rare Fishes
Fundulus dispar	Starhead Topminnow	END		Rare Fishes
Ictiobus niger	Black Buffalo	THR		Rare Fishes
Luxilus chrysocephalus	Striped Shiner	END		Rare Fishes
Lythrurus umbratilis	Redfin Shiner	THR		Rare Fishes
Macrhybopsis hyostoma	Shoal Chub	THR		Rare Fishes
Moxostoma carinatum	River Redhorse	THR		Rare Fishes
Moxostoma duquesnei	Black Redhorse	END		Rare Fishes
Notropis anogenus	Pugnose Shiner	THR		Rare Fishes
Polyodon spathula	Paddlefish	THR		Rare Fishes
Dichromorpha viridis	Short-winged Grasshopper	SC/N		Rare Grasshoppers and Allies
Aflexia rubranura	Red-tailed Prairie Leafhopper	END		Rare Leafhoppers and True Bugs
Kansendria kansiensis	A Leafhopper	SC/N		Rare Leafhoppers and True Bugs
Laevicephalus vannus	A Leafhopper	SC/N		Rare Leafhoppers and True Bugs
Myndus ovatus	A Planthopper	SC/N		Rare Leafhoppers and True Bugs
Polyamia dilata	Prairie Leafhopper	THR		Rare Leafhoppers and True Bugs
Prairiana angustens	A Leafhopper	SC/N		Rare Leafhoppers and True Bugs

Scientific Name	Common Name	Status		Group
Prairiana cinerea	A Leafhopper	SC/N		Rare Leafhoppers and True Bugs
Eptesicus fuscus	Big Brown Bat	THR		Rare Mammals
Microtus ochrogaster	Prairie Vole	SC/N		Rare Mammals
Microtus pinetorum	Woodland Vole	SC/N		Rare Mammals
Myotis lucifugus	Little Brown Bat	THR		Rare Mammals
Myotis septentrionalis	Northern Long-eared Bat	THR	LT	Rare Mammals
Perimyotis subflavus	Eastern Pipistrelle	THR		Rare Mammals
Poliocitellus franklinii	Franklin's Ground Squirrel	SC/N		Rare Mammals
Alasmidonta marginata	Elktoe	SC/P		Rare Mussels and Clams
Arcidens confragosus	Rock Pocketbook	THR		Rare Mussels and Clams
Ellipsaria lineolata	Butterfly	END		Rare Mussels and Clams
Lampsilis higginsii	Higgins Eye	END	LE	Rare Mussels and Clams
Lampsilis teres	Yellow & Slough Sandshells	END		Rare Mussels and Clams
Plethobasus cyphyus	Sheepnose	END	LE	Rare Mussels and Clams
Quadrula metanevra	Monkeyface	THR		Rare Mussels and Clams
Quadrula nodulata	Wartyback	THR		Rare Mussels and Clams
Tritogonia verrucosa	Buckhorn	THR		Rare Mussels and Clams
Truncilla donaciformis	Fawnsfoot	THR		Rare Mussels and Clams
Venustaconcha ellipsiformis	Ellipse	THR		Rare Mussels and Clams
Coluber constrictor	North American Racer	SC/P		Rare Reptiles
Crotalus horridus	Timber Rattlesnake	SC/P		Rare Reptiles
Emydoidea blandingii	Blanding's Turtle	SC/P	SOC	Rare Reptiles
Ophisaurus attenuatus	Slender Glass Lizard	END		Rare Reptiles
Pantherophis spiloides	Gray Ratsnake	SC/P		Rare Reptiles
Pituophis catenifer	Gophersnake	SC/P		Rare Reptiles
Sistrurus catenatus	Eastern Massasauga	END	LT	Rare Reptiles
Terrapene ornata	Ornate Box Turtle	END		Rare Reptiles
Thamnophis proximus	Western Ribbonsnake	END		Rare Reptiles
Thamnophis radix	Plains Gartersnake	SC/H		Rare Reptiles

** WI Status: Protection category designated by the DNR. END = endangered; THR = threatened; SC = special concern (SC/P = fully protected; SC/N = no laws regulating use, possession, or harvesting; SC/H = take regulated by establishment of open closed seasons; SC/FL = federally protected as endangered or threatened, but not so designated by DNR; SC/M = fully protected by federal and state laws under the Migratory Bird Act).*

***Federal Status: LE = listed endangered; LT = listed threatened; SOC = species of concern.*

APPENDIX C: 303(D) IMPAIRED WATERS IN DANE COUNTY

Local Waterbody Name	Water Type	WBIC	Start Mile	End Mile	Date Listed	Pollutant	Status
Allen Creek	RIVER	883700	22.96	26.98	4/1/2016	Total Phosphorus	303d Listed
Badfish Creek	RIVER	799500	0	12.3	4/1/2012	Total Phosphorus	303d Listed
Badfish Creek	RIVER	799500	0	12.3	4/1/1998	PCBs	303d Listed
Badfish Creek	RIVER	799500	12.31	13.18	4/1/1998	PCBs	303d Listed
Badger Mill Creek	RIVER	888100	0	2	4/1/2018	Total Phosphorus	Proposed for List
Badger Mill Creek	RIVER	888100	2	5	4/1/2018	Total Phosphorus	Proposed for List
Belleville Millpond	LAKE	4000040			4/1/2016	Total Phosphorus	303d Listed
Black Earch Creek	RIVER	1248600	6.95	11.08	4/1/2016	Unknown Pollutant	303d Listed
Black Earth Creek	RIVER	1248600	0	6.95	4/1/2018	Total Phosphorus	Addition
Ditch to the Oregon Branch of Badfish Creek	RIVER	800800	0	3.63	4/1/2012	PCBs	303d Listed
Door Creek	RIVER	802800	0	14.02	4/1/2012	Total Phosphorus	303d Listed
Esther Park Beach	INLAND BEACH	804600	0	0.15	4/1/2014	E. coli	303d Listed
Fish Lake	LAKE	985100			4/1/2016	Total Phosphorus	303d Listed
Goose Lake	LAKE	872600			4/1/2016	Total Phosphorus	303d Listed
Halfway Prairie Creek	RIVER	1248800	0	8	4/1/2016	Unknown Pollutant	303d Listed
Halfway Prairie Creek	RIVER	1248800	0	8	4/1/2004	Sediment/Total Suspended Solids	303d Listed
Hudson Park Beach	INLAND BEACH	804600			4/1/2014	E. coli	303d Listed
Lake Kegonsa	LAKE	802600			4/1/2012	Total Phosphorus	TMDL Approved

Local Waterbody Name	Water Type	WBIC	Start Mile	End Mile	Date Listed	Pollutant	Status
Lake Koshkonong	LAKE	808700			4/1/2002	Sediment/Total Suspended Solids	TMDL Approved
Lake Koshkonong	LAKE	808700			4/1/2002	Total Phosphorus	TMDL Approved
Lake Waubesa	LAKE	803700			4/1/2012	Total Phosphorus	TMDL Approved
Lake Wingra	LAKE	805000			4/1/2012	PCBs	303d Listed
Little Door Creek	RIVER	802900	0	5.93	4/1/2018	Total Phosphorus	Proposed for List
Local Water	RIVER	806300	0	2.51	4/1/2018	Total Phosphorus	Proposed for List
Local Water	RIVER	5035724	0	4.98	4/1/2018	Total Phosphorus	Proposed for List
Lower Koshkonong Creek	RIVER	808800	0	27.27	4/1/2012	Total Phosphorus	303d Listed
Marsh Creek	RIVER	1252900	1	4	4/1/2018	Unknown Pollutant	Proposed for List
Maunesha River	RIVER	837500	5.49	13.21	4/1/1998	Total Phosphorus	TMDL Approved
Maunesha River	RIVER	837500	5.49	13.21	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Maunesha River	RIVER	837500	13.21	31.8	4/1/1998	Total Phosphorus	TMDL Approved
Maunesha River	RIVER	837500	13.21	31.8	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Mendota County Park Beach	INLAND BEACH	805400			4/1/2016	E. coli	303d Listed
Mendota Lake	LAKE	805400			4/1/1998	PCBs	303d Listed
Mendota Lake	LAKE	805400			4/1/2012	Total Phosphorus	TMDL Approved

Local Waterbody Name	Water Type	WBIC	Start Mile	End Mile	Date Listed	Pollutant	Status
Milun Creek	RIVER	886300	0	2.44	4/1/2018	Total Phosphorus	Proposed for List
Monona Lake	LAKE	804600			4/1/1998	PCBs	303d Listed
Monona Lake	LAKE	804600			4/1/2012	Total Phosphorus	TMDL Approved
Mud Creek	RIVER	840800	0	10.77	4/1/2016	Total Phosphorus	303d Listed
Mud Creek	RIVER	840800	0	10.77	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Mud Lake	LAKE	1006500			4/1/2018	Total Phosphorus	Proposed for List
Murphy (Wingra) Creek	RIVER	804700	0	1.2	4/1/1998	Unknown Pollutant	303d Listed
Murphys Creek	RIVER	803900	0	4.69	4/1/2018	Total Phosphorus	Proposed for List
Nine Springs Creek	RIVER	804200	0	6.16	4/1/2004	Total Phosphorus	TMDL Approved
Nine Springs Creek	RIVER	804200	0	6.16	4/1/2004	Sediment/Total Suspended Solids	TMDL Approved
Odana Pond	LAKE	3000513			4/1/2012	Chloride	303d Listed
Odana Pond	LAKE	3000513			4/1/2012	Total Phosphorus	303d Listed
Olbrich Park Beach	INLAND BEACH	804600			4/1/2008	E. coli	303d Listed
Olin Park Beach	INLAND BEACH	804600			4/1/2008	E. coli	303d Listed
Oregon Branch	RIVER	800700	0	4.74	4/1/2012	PCBs	303d Listed
Pheasant Branch	RIVER	805900	0	1	4/1/2016	Chloride	303d Listed
Pheasant Branch	RIVER	805900	0	1	4/1/1998	Total Phosphorus	TMDL Approved

Local Waterbody Name	Water Type	WBIC	Start Mile	End Mile	Date Listed	Pollutant	Status
Pheasant Branch	RIVER	805900	0	1	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Pheasant Branch	RIVER	805900	1	9.09	4/1/2016	Chloride	303d Listed
Pheasant Branch	RIVER	805900	1	9.09	4/1/1998	Total Phosphorus	TMDL Approved
Pheasant Branch	RIVER	805900	1	9.09	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Roxbury Creek	RIVER	1259900	0	4	4/1/2014	Total Phosphorus	303d Listed
Six Mile Creek	RIVER	805500	0	8.5	4/1/2016	Total Phosphorus	303d Listed
Spring (Dorn) Creek	RIVER	805600	0	1	4/1/2018	Total Phosphorus	Proposed for List
Spring (Dorn) Creek	RIVER	805600	1	6.46	4/1/2002	E. coli	303d Listed
Spring (Dorn) Creek	RIVER	805600	1	6.46	4/1/2016	Total Phosphorus	303d Listed
Spring (Dorn) Creek	RIVER	805600	1	6.46	4/1/2002	Sediment/Total Suspended Solids	TMDL Approved
Spring Harbor Beach	INLAND BEACH	805400			4/1/2014	E. coli	303d Listed
Starkweather Creek	RIVER	805100	0	3.65	4/1/1998	Unspecified Metals	303d Listed
Starkweather Creek	RIVER	805100	0	3.65	4/1/2016	Chloride	303d Listed
Starkweather Creek	RIVER	805100	0	3.65	4/1/1998	BOD	303d Listed
Starkweather Creek	RIVER	805100	0	3.65	4/1/1998	Sediment/Total Suspended Solids	303d Listed
Stony Brook	RIVER	837600	0	15.43	4/1/2006	Sediment/Total Suspended Solids	TMDL Approved
Swan Creek	RIVER	803800	0	4.44	4/1/2018	Total Phosphorus	Proposed for List

Local Waterbody Name	Water Type	WBIC	Start Mile	End Mile	Date Listed	Pollutant	Status
Tenny Park Beach, Lake Mendota	INLAND BEACH	805400			4/1/2014	E. coli	303d Listed
Token Creek	RIVER	806600	2.95	3.44	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Token Creek	RIVER	806600	3.44	7.25	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Token Creek	RIVER	806600	7.25	9.9	4/1/2016	Total Phosphorus	303d Listed
Token Creek	RIVER	806600	7.25	9.9	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Token Creek	RIVER	806600	9.9	11.65	4/1/2016	Total Phosphorus	303d Listed
Unnamed Creek Trib To Upper Mud Lake	RIVER	804100	0	5.65	4/1/2018	Total Phosphorus	Proposed for List
Unnamed Stream	RIVER	803500	2	4.1	4/1/2018	Total Phosphorus	Proposed for List
Unnamed Stream	RIVER	801500	0	3.71	4/1/2018	Total Phosphorus	Proposed for List
Unnamed Stream	RIVER	802400	0	5.33	4/1/2018	Total Phosphorus	Proposed for List
Unnamed Trib to Lake Kegonsa	RIVER	803300	0	3.01	4/1/2018	Total Phosphorus	Proposed for List
Unnamed Trib to Spring Creek	RIVER	5033250	0	3.78	4/1/2018	Total Phosphorus	Proposed for List
Unnamed Trib to Token Creek	RIVER	5033839	0	0.64	4/1/2018	Total Phosphorus	Proposed for List
Unnamed Trib to Yahara R	BAY/HARBOR	806300			4/1/2016	Total Phosphorus	303d Listed
Unnamed Trib to Yahara R	RIVER	5033743	0	1.14	4/1/2018	Total Phosphorus	Proposed for List
Upper Koshkonong	RIVER	808800	27.27	48.42	4/1/2012	Total Phosphorus	303d Listed
Upper Koshkonong	RIVER	808800	27.27	48.42	4/1/2016	Unknown Pollutant	303d Listed
Vermont Creek	RIVER	1249200	0	3.46	4/1/2004	Sediment/Total Suspended Solids	303d Listed

Local Waterbody Name	Water Type	WBIC	Start Mile	End Mile	Date Listed	Pollutant	Status
Vermont Creek	RIVER	1249200	0	3.46	4/1/2018	Total Phosphorus	Addition
Vermont Creek	RIVER	1249200	3.43	9.56	4/1/2018	Unknown Pollutant	Proposed for List
Vilas Park Beach	INLAND BEACH	805000			4/1/2008	E. coli	303d Listed
W. Br. Starkweather Creek (Airport Road Creek)	RIVER	805200	0	2.6	4/1/2016	Chloride	303d Listed
Wendt Creek	RIVER	1248900	0.01	3.64	4/1/1998	Sediment/Total Suspended Solids	303d Listed
Wendt Creek	RIVER	1248900	3.63	8.27	4/1/1998	Sediment/Total Suspended Solids	303d Listed
West Branch Sugar River	RIVER	886100	0	7.64	4/1/2012	Total Phosphorus	303d Listed
West Branch Sugar River	RIVER	886100	7.65	18.82	4/1/2018	Total Phosphorus	Proposed for List
Wi-173-Lw18-978900	LAKE	978900			4/1/2016	Total Phosphorus	303d Listed
Wisconsin River	RIVER	1179900	57.66	90.94	4/1/1998	PCBs	303d Listed
Yahara R. Badfish Cr To Stoughton	RIVER	798300	7.29	16.32	4/1/1998	Total Phosphorus	TMDL Approved
Yahara R. Badfish Cr To Stoughton	RIVER	798300	7.29	16.32	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved
Yahara River	RIVER	798300	42.71	47.11	4/1/2016	Total Phosphorus	303d Listed
Yahara River	RIVER	798300	47.11	63.05	4/1/2016	Chloride	303d Listed
Yahara River	RIVER	798300	47.11	63.05	4/1/2014	Total Phosphorus	TMDL Approved
Yahara, Stoughton To L. Kegonsa	RIVER	798300	16.32	22.06	4/1/1998	Sediment/Total Suspended Solids	TMDL Approved

Data as of August 2018, WDNR

LAND&WATER RESOURCES DEPARTMENT

Laura M. Hicklin, Director
Joe Parisi, Dane County Executive

Land Conservation • Office of Lakes & Watersheds • Parks • Water Resource Engineering

Dane County Land & Water Resource Management Plan
Advisory Committee Meeting

April 26, 2018
1:30 pm – 3:30 pm
Room 121

AGENDA

Meeting Overview

Brief Committee Member Introductions

Overview of the Land & Water Resource Management Plan

- *Purpose and Requirements of the Plan*
- *Overview of Land & Water Resources of Dane County*
- *Advisory Committee Roles & Responsibilities*

Committee Input and Facilitated Discussion

- *Goals & Objectives*
- *Brainstorming Activity*
- *Report Out & Discussion*

Wrap Up and Preparation for June Meeting

Lyman F. Anderson Agriculture & Conservation Center
5201 Fen Oak Drive, Room 208, Madison, WI 53718; Phone: (608)224-3730 Fax: (608)224-3745
www. countyofdane.com/lwrd

LAND&WATER RESOURCES DEPARTMENT

Laura M. Hicklin, Director
Joe Parisi, Dane County Executive

Land Conservation • Office of Lakes & Watersheds • Parks • Water Resource Engineering

Dane County Land & Water Resource Management Plan
Advisory Committee Meeting

Wednesday, July 25, 2018
1:30 pm – 3:30 pm
Room AB

AGENDA

Brief Committee Member Introductions

Meeting Overview

Overview of the Draft Recommendations
- *Goals and Objectives*

Committee Input and Facilitated Discussion
- *Actions and Priorities*

Next Steps

Lyman F. Anderson Agriculture & Conservation Center
5201 Fen Oak Drive, Room 208, Madison, WI 53718; Phone: (608)224-3730 Fax: (608)224-3745
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Land Conservation • Office of Lakes & Watersheds • Parks • Water Resource Engineering

FOR IMMEDIATE RELEASE
Contact: Amy Piaget, County Conservationist
608-224-3740, piaget.amy@countyofdane.com

Dane County Seeks Public Input for Land and Water Resource Management Plan

MADISON, WI – October 22, 2018 – Dane County is updating its Land and Water Resource Management Plan and is seeking public input. A land and water resource management plan is a long-term strategic plan that includes an assessment of the natural resource conditions and needs of a county. The process includes input from local citizens as well as resource professionals and directs conservation efforts. While the plan is a 10-year document, it is used in the development of annual work plans and to help apply for conservation grant funding. The process and plan is a holistic approach to land and water resource management that focuses on partnerships and collaboration.

The draft plan is available for comment on the Dane County Land & Water Resources Department website at https://lcd-lwrd.countyofdane.com/Resources/LWRM-Plan. Comments can be submitted online and will be accepted through November 21, 2018. In addition, the Dane County Land Conservation Committee will be hosting a public hearing on November 15, 2018 at 5:00 pm at the Lyman F Anderson Agriculture and Conservation Center, 5201 Fen Oak Drive, room 121 in Madison, Wisconsin.

About Dane County Land & Water Resources Department
The Dane County Land & Water Resources Department works to protect and enhance Dane County's natural, cultural, and historic resources. It provides the county's residents with a broad array of accessible, high quality resource-based recreational services and facilities, and supports residents, communities, local governments and other agencies and organizations in their resource management and protection activities.

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APPENDIX E: 10-YEAR GOALS, OBJECTIVES & ACTIONS

GOAL I. ASSESS, PROTECT AND IMPROVE SURFACE AND GROUNDWATER RESOURCES IN DANE COUNTY.

Objectives	Priority	Actions
Reduce the quantity of sediment and nutrients (phosphorus and nitrogen) reaching surface and ground waters.	HIGH	Expand harvestable buffer program on agricultural land.
		County leased land will have a Conservation Plan and approved Nutrient Management Plan.
		Reduce the volume of manure spread on frozen ground by increasing manure storage.
		Work with landowners and agricultural producers to evaluate and achieve compliance with Chapter 14 and NR 151 State Agricultural Performance Standards and Prohibitions.
		Review Nutrient Management Plans and conservation plans with landowners to educate landowners and facilitate dialog.
		Participate in Standards Oversight Committee's that provide recommendations for technical standards based on science.
		Respond to complaints in a timely manner and utilize the Dane County stepped enforcement process to obtain compliance.
		Conduct educational workshops, forums, and field demonstrations.
		Utilize Federal, State and Local funding to implement effective agricultural conservation practices to achieve/maintain compliance with Ch. 14 and the State APSP.
		Promote the use of the most recent nutrient management planning models by producers and agronomists.
		Monitor and enforce Dane County Winter Manure Spreading permit as required by Ch. 14.
		Review and oversee implementation of manure storage construction and closure plans, and any other required best management practices necessary to meet the APSP, to ensure it is done in accordance with standards identified in Chapter 14 and NR151.
		Work with producers looking to expand their livestock facilities in site assessment and pre-planning discussions.
		Work with landowners to implement conservation practices to meet the objectives of TMDL's.
		Encourage homeowners to get out of the weed-n-feed manicured lawns mentality.
		Implement Yahara CLEAN within agreed upon timeline.
Decrease the amount of pharmaceuticals compounds reaching surface waters	LOW	Educate local companies on proper way to dispose of medicines so they can pass along information to customers (e.g. Walgreens).
Improve soil health to	HIGH	Promote no till and reduced tillage in cropping systems, cover crops and other management practices that will

Objectives	Priority	Actions
reduce soil erosion, improve infiltration and reduce nutrient loses.		improve soil health.
		Promote management intensive grazing (convert cropland, use in conjunction with cover crops where possible)
		Provide education resources on improving soil health and conservation practices.
Build awareness regarding economic and environmental value of developing and implementing a nutrient management plan.	LOW	Provide Nutrient Management workshops for landowners to develop plans on their own.
		Address conservation planning through nutrient management planning on all agricultural lands in Dane County.
		Incorporate industrial waste, sewerage sludge, and septic waste into nutrient management planning.
Assess and Protect groundwater resources in Dane County.	HIGH	Educate landowners to the importance of sealing unused wells.
		Refer landowners with wells to abandon to the City of Madison- Dane County Public Health and UWEX for grant assistance.
		Improve existing private wells as they are a direct conduit to groundwater.
		Maximize infiltration on public lands.
		Continue to characterize NO_3 levels and geographic distribution in Dane County.
		Develop outreach campaign for drinking water quality for general public who have private wells to encourage regular testing.
Improve and enhance erosion control and stormwater management runoff to reduce the quantity of runoff and improve the quality of runoff.	HIGH	Review erosion control and storm water management plans to ensure they comply Ch. 11 and 14.
		Work with other Dane County Departments to ensure compliance with NR 216 requirements.
		Reduce rate of expansion of impervious surfaces in important recharge areas.
		Promote rainwater capture to reduce stormwater runoff.
		Implement and expand the urban non-point source funding program (**Urban Water Quality Grant Program**).
		Develop new TSS/TP quantity reduction techniques.
		Develop policy that requires new developments to capture 100% stormwater on site.
		Continue to monitor and require regular maintenance of existing stormwater facilities.
		Participate in **Green Tier Clear Water Initiative** (GTCWI).
		Participate in permeable pavement demos using the LWRD parking lot as a demonstration site (assuming permeable pavement is installed).
		Expand "**leaf free**" streets campaign to encourage adoption by communities not already participating.
		Promote installation of rain gardens/ bio retention ponds through county implementation grants.
		Annual review of administrative policies and procedures to improve program delivery.

Objectives	Priority	Actions
Reduce salt utilization to minimize impacts on surface and groundwater resources	MEDIUM	Increase education relating to chloride reductions.
		Upgrade water softeners through grants, incentives and ordinance change.
		Reduce tons of salt (or equivalent product) per area managed. Continue "**Salt Wise**" efforts.
		Track salt use.
		Easy to find steps to reduce individual salt use (what are 'acceptable' softeners?)
		Promote non salt technologies for water softening for commercial use.
		Expand management of salt application on impervious surfaces to meet established WI specific salt application criteria.
		Explore chloride alternatives to minimize use.

GOAL II: MAINTAIN VIABLE AGRICULTURAL LANDS FOR LONG-TERM PRODUCTION.

Objectives	Priority	Actions
Reduce the rate of urban expansion by preserving priority farmlands and open space.	MEDIUM	Secure permanent easements or land purchases to restrict the rate of urban expansion.
		Provide incentives for landowners to permanently conserve land.
		Provide incentives for infill development.
		Create incentive program for new farmers to purchase land or incentive to pass farms down through families.
		Promote participation in the Farmland Preservation Program.
		Promote growth that aligns with the Dane County Smart Growth Plan.
		Implement the recommendations of the Dane County Parks and Open Space Plan for Purchase Development Rights (PDR) on production agricultural areas.
		Assist towns in identifying key land characteristics to be used for developing and executing Transfer of Development Rights. (TDR)

GOAL III: DEVELOP, EXPLORE AND IMPLEMENT INNOVATIVE IDEAS.

Objectives	**Priority**	**Actions**
Encourage new methods of water quality improvement.	MEDIUM	Continue funding and expand the "Suck the Muck" **Legacy Phosphorus** removal project.
		Increase net export of phosphorus from identified high risk watersheds through activities such as manure brokering to achieve balanced, sustainable phosphorus budgets.
		Explore alternative manure management options including the use of variable rate technologies.
		Continue to develop/research new methodologies to mitigate adverse effects of stormwater runoff.
Enhance renewable energy opportunities.	LOW	Connect landfill and manure digesters to interstate gas pipeline.

GOAL IV. PROTECT AND ENHANCE IN-STREAM, RIPARIAN, WETLAND, AND UPLAND HABITAT.

Objectives	Priority	Actions
Protect, restore and stabilize stream banks and shorelines.	HIGH	Continue to apply for nonpoint source and other applicable grants while considering the broader value of flora, wildlife, and water quality in addition to overall habitat.
		Work with partner agencies NGOs and other conservation groups to identify critical stream corridors for targeting resources.
		Refer to DNR Basin Plans for coordinated approach to prioritize areas based in water quality needs and updated 303 (d) listed waters.
		Where applicable, use the stream corridor protection and management criteria outlined in the **Dane County Parks and Open Space Plan (POSP)** to assist with streambank restoration.
		Acquire permanent streambank easements in Dane County utilizing any available grant funding options.
		Explore options for long-term maintenance programs on county owned easements.
		Work with private landowners to plan and oversee installation of streambank and shoreline protection projects including instream habitat.
		Assess bridge and culvert crossings, and other stream barriers, to reduce the number of in-stream impediments.
Restore wetland and upland habitat.	MEDIUM	Promote Federal, State and local programs to assist landowners with technical and financial planning.
		Restore/acquire wetlands identified in water quality plans in Dane County utilizing any available grant funding options.
		Refer landowners to partner agencies and, NGOs specializing in upland restoration and enhancement programs.
		Provide grants/financial assistance to partners to purchase land and restore natural areas for public use.

Objectives	Priority	Actions
		Continue to purchase lands for public use focusing on larger tracks of land or lands that have unique habitat value or that are adjacent to public waters.
		Improve the quality of access to county owned properties as well as the natural communities on those properties.
Protect springs in Dane County.	HIGH	Continue to identify and map springs in Dane County (some mapped in Dane County Groundwater Study).
		Encourage the enhancement and preservation of recharge areas of springs during conservation planning.
		Encourage the use of buffers to protect springs.
Minimize conversion of wetlands to agricultural and urban development.	MEDIUM	Map hydric soils and flood prone areas as educational tools (where not to build).
		Evaluate need for additional wetland/hydric soil regulation.
		Continue to avoid and mitigate through the Chapter 14 storm water plan review and approval process.
		Continue to use the **POSP** to identify and acquire wetlands in Dane County.
		Use the **Dane County Wetlands Resource Management Guide** as a tool to protect and enhance wetlands in Dane County.
Develop/expand invasive species programs (aquatic and terrestrial) aimed at preventing introduction of new species and reducing existing	LOW	Continue to implement the Dane County Aquatic Invasive Species management plan and update as needed.
		Continue to educate water resource users on the impacts and actions they can take to reduce impacts

Objectives	Priority	Actions
species		and transfer through the Clean Boats Clean Waters program and other educational outlets.
		Continue and or expand aquatic plant harvesting operations to manage existing Eurasian Water Milfoil infestation.
		Continue to implement aquatic plant management plans for the Yahara chain of Lakes and the development of plans for other water resources in Dane County.
		Continue to implement the Emerald Ash Borer Management and Response Plan.
		Continue to implement the Gypsy Moth program (State funding sunsets at end of 2018).
		Continue to implement eradication contracts through federal programs.
		Participate in development of programs to implement **Dane County's Water Classification project initiatives** adopted by the Dane County Board.

GOAL V. PARTNER WITH AND INVOLVE CITIZENS ON SOIL AND WATER PROTECTION AND IMPROVEMENT INITIATIVES IN DANE COUNTY.

Objectives	Priority	Actions
Support individuals along with watershed groups and organizations in their education of citizens about resource improvement; pollution prevention.	MEDIUM	Continue annual water resource management meetings with DNR regional staff to maintain common resource management goals are identified and program implementation is consistent with NR 151 and watershed planning.
		Provide technical assistance and outreach materials when available.
		Promote and/or support the efforts of others in the formation of watershed organizations and friends groups throughout Dane County.
		Continue Take a Stake in the Lakes Days and all associated programs including "Dane County Waters

Objectives	Priority	Actions
		Champion" recognition.
		Give presentations to groups, associations and organizations on various topics relating to water quality when invited.
		Continue to support citizen and NGO based water quality monitoring programs in Dane County
		Continue to support the efforts of producer- led watershed groups such as "Farmers for the Upper Sugar River" and "Yahara Pride Farms".
Educate urban and rural residents on health and value of land and water resources and protection measures.	MEDIUM	Use media campaigns, flyers, newsletter articles, annual reports, websites, presentations, videos, editorial board meetings, displays at meetings, expos and other venues, kiosks, bulletin boards, etc. to disseminate information.
		Coordinate with MAMSWaP Information & Education Plan implementation, including Plant Dane native vegetation grants.
		Coordinate with any outreach plans that emerge from the Yahara Lakes Legacy Partnership.
		Use watershed and agricultural newsletters to educate and promote compliance with programs and goals including the ag requirements of Ch. 14 and the State APSP.
		Dane County will explore the development of "Dane Demos", a collaboration between Dane County, Dane County UW-Extension Ag staff, partners and farmers to promote soil health.
Educate and inform the public about the threats posed by aquatic and terrestrial invasive and exotic species.	MEDIUM	Coordinate with the Dane County Lakes and Watershed Commission, Dane County Parks Commission and WDNR on distribution of educational materials relating to invasive species.
		Incorporate information into Dane County Boater safety classes.
		Continue to support educational components of aquatic and terrestrial invasive species program.
		Work with partnering agencies to identify new invasive species threats and management alternatives for newly identified and existing threats.

Objectives	Priority	Actions
		Coordinate with volunteer groups to help reduce the spread of invasive species and restore natural habitats.
		Support research on newly identified Aquatic Invasive Species in Dane County.
Inform and educate county, municipal, and town officials on the health and value of land and water resources in Dane County.	LOW	Explore development of educational briefing for newly elected officials on responsibilities and programs of Dane County agencies.
		Invite other elected officials as appropriate.
		Continue to offer rural and urban tours to committees and elected officials that focus on land and water conservation initiatives.
Promote sustainable recreational opportunities in Dane County	MEDIUM	Continue to implement the POSP recommendations to preserve and create parkland and other natural resource recreational opportunities.
		Where applicable, assist in program delivery to implement recreational objectives outlined in the Dane County Comprehensive Plan.
		Expand educational and recreational opportunities with the potential of implementing an indoor and outdoor classroom at the Lussier Heritage Center.
		Consider the results of the Yahara Lakes Recreational Use Survey, completed in 2015, when identifying priority projects, including infrastructure, on the Yahara chain of lakes.
		Work with partnering organizations to identify funding mechanisms that promote recreation in Dane County.
Make grants available to local units of government and non- profits to protect and enhance land and water resources.	HIGH	Provide grant opportunities through the Conservation Fund Grant Program, Park Partner Match Program, Scheidegger Trust Fund, Plant Dane Matching Program, and Dane County Environmental Council.
		Continue to build awareness among partners on County grant opportunities.

Objectives	Priority	Actions
		Provide guidance and assistance to applicants on grant project proposals and applications.
Work with agencies, consultant, contractors and developers in Dane County to ensure erosion control and stormwater management are met.	LOW	Implement procedures for ensuring consistent municipal implementation.
		Offer technical and administrative training to municipal staff, developers and consultants.
		Update ECSM manual to include new technical information as needed.
		Maintain email list of contractors, developers, consultants and municipal staff, and use to inform of changes to ECSM manual, workshops, etc.
		Maintain web page resources for implementation.
		Provide information & education assistance detailing the importance of Dane County water resources.
Promote partnerships to leverage funding and resources for conservation practices in order to target funding or resource gaps in the county.	MEDIUM	Identify current funding programs used by the county and the eligible conservation practices.
		Determine what types of practices or variations of practices are not eligible for current funding (e.g. not meeting established technical standard or there is no technical standard, etc.) and create new funding opportunities to fill the gaps.

APPENDIX F: HEALTHY FARMS, HEALTHY LAKES TASKFORCE RECOMMENDATIONS

Healthy Farms
Healthy Lakes
Task Force
Recommendations

Approved on August 1, 2018

Introduction

The Dane County Board of Supervisors created the Dane County Healthy Farms, Healthy Lakes Task Force in 2017 with a charge to make recommendations for phosphorous reduction in surface waters.

The task force brought together a group of stakeholders and experts from a variety of backgrounds including agriculture, community groups, and state and local agencies to learn more from experts and each other and to build on what had previously been done to improve water quality.

The following goals and recommendations were developed by the task force during 2018. Implementation of the goals and recommendations will occur over time and in tandem with other existing and future plans and efforts. While it is anticipated that Dane County may play a role in implementation of many of the recommendations, there are any number of community partners and other political entities that are anticipated to play lead or supporting roles.

Opportunities for implementation and funding of task force goals and recommendations are particularly strong within the Yahara Watershed, which is the focus of considerable voluntary and regulatory plans, policies, programs and initiatives. Dane County has historically played a leadership role in supporting clean water initiatives and has directed considerable resources in support of efforts to reduce nutrient and sediment loads. Yahara WINS, led by Madison Metropolitan Sewerage District, has brought together twenty-four municipal entities within the Yahara Watershed that are working together and making investments to reduce phosphorus and sediment loads to meet regulatory obligations. Clean Lakes Alliance has brought together a diverse group of stakeholders and has made considerable investments to reduce phosphorus loads to the Madison Lakes. The Yahara Pride Farm Group is working with farmers in the watershed to meet multiple goals, including reducing soil and phosphorus loss from farm fields. Multiple other groups are working to improve water quality within the Yahara Watershed.

The task force recognizes that both urban and rural sources contribute to the phosphorus load delivered to our lakes. While this task force has focused on the rural component, we invite rural and urban communities to work together to identify additional phosphorus reduction or management approaches that may have future potential merit.

HFHL TF Recommendation Goals

1. Increase support and encourage conservation efforts by farmer-led groups and watershed organizations to improve nutrient management and reduce nonpoint source runoff from farms.

   Recommendations

   A. Engage with farmer-led groups and watershed organizations to understand how we might further support their efforts. For example:
      i. Equipment needs
      ii. Training/education needs
      iii. Support needs (e.g. coordinator position, outreach, etc.)
      iv. Regulatory obstacles (e.g. recent WDNR streamlined General Permit for conservation efforts to remove regulatory barriers that have inhibited practices such as waterways and buffers)
      v. Financial obstacles
      vi. Funding support through innovative or pilot programs such as "pay for performance"
   B. Engage with agronomists and agriculture industry partners to understand how we might support the efforts of farmer-led groups and work together to improve nutrient management and reduce nonpoint runoff from farms.
   C. Develop collaborations between government, community partners and farmers to promote water quality and soil health through demonstrations that:
      i. Maintain continuous living cover
      ii. Minimize soil disturbance
      iii. Maximize soil biodiversity
      iv. Improve nutrient management and reduce nonpoint runoff risks
   D. Develop and promote voluntary local standards to address locally identified resource concerns and priorities (e.g. manure and fertilizer handling and management).

2. Enforce reasonable management regulations at the local level by adopting state agricultural performance standards into county ordinance as a complement to the state agricultural prohibitions already in county ordinance.

Recommendations

A. Update Chapter 2 and Chapter 14, Dane County Ordinance, to include the state's agricultural performance standards for local implementation and enforcement:
   i. Sheet and rill erosion
   ii. Wind erosion
   iii. Tillage setback
   iv. Phosphorus Index
   v. Manure storage facilities
   vi. Process wastewater handling
   vii. Clean water diversion
   viii. Nutrient management
B. Update the Dane County Land & Water Resources Management Plan to align implementation procedures with current initiatives and ordinance requirements.

3. Improve the use of manure nutrients and prevent nutrient losses through improved manure management.

Recommendations

A. Update and expand Chapter 14, Dane County Ordinance, manurestorage permitting language, to include:
   i. Stay current with technical standard requirements for manurestorage
   ii. Expand definitions to include new and emerging manure management techniques (i.e. composting, pelleting, digesters)
   iii. Expand the permitting requirements to address process wastewater (i.e. milkhouse waste, feed leachate)
   iv. Improve manure storage application form
B. Create and administer a manure storage "certificate of use" program through updates to Chapter 14, Dane County Ordinance. The certificate would apply to all manure storages in the county to evaluate safety and maintenance, track storage use and volumes, and improve implementation of nutrient management planning.
C. Continue to pursue innovative manure processing, management and treatment options including but not limited to:
   i. Composting
   ii. Digesters
   iii. Community manure storage and/or processing into newproducts
   iv. Exportation and/or exchange of manure
   v. Low disturbance manure injection
   vi. Nutrient concentration systems
D. Update and expand Chapter 14, Dane County Ordinance, winter spreading permit program, to include:
   i. Align permit conditions with the new winter spreading requirements in the current 590 nutrient management technical standard
   ii. Expand winter spreading permit requirement to all manure types (i.e. solid, liquid)
   iii. Tie winter spreading requirements to nutrient management planning

4. Improve soil and water quality through the expansion, adoption and implementation of nutrient management plans along with the development and maintenance of a tracking database.

Recommendations

A. Develop a systematic approach for achieving nutrient management plan implementation on 100% of all eligible agricultural land within the county.
B. Develop and maintain a robust and comprehensive county-wide nutrient management plan database including:
    i. The extent of nutrient management plan coverage
    ii. Planned rotational average phosphorus index levels
    iii. Soil test phosphorus levels
    iv. Ability to conduct periodic data evaluations and reporting of aggregated trends
    v. Ability to integrate with other county conservation data management systems
    vi. Report aggregate phosphorus balance trends (by watershed / sub-watershed / TMDL stream reach)
    vii. Ability to integrate electronic nutrient management plans
C. Focus on field Phosphorus Index level, determined according to state nutrient management standards, as an indicator of farm landscape propensity for phosphorus runoff and on soil test phosphorus as an indicator of long-term resilience. Work to record and monitor these and other key indicators across the Yahara watershed, and to identify improvements that may be needed to achieve water quality goals (including TMDL and Yahara CLEAN goals). Focus community attention, resources and support, including possible "pay for performance" initiatives, to achieve needed improvements in key indicators.

5. Continue to support, implement and evaluate the Yahara CLEAN Strategic Action Plan and other Yahara watershed water quality efforts.

Recommendations

A. Reconvene the Yahara CLEAN partnership coalition for the purpose of evaluating, updating and adopting the *Yahara CLEAN Strategic Action Plan for Phosphorus Reduction* (2012). Updates shall account for progress from implemented actions, new information and assumptions used in estimating needed phosphorus reductions, revised cost estimates, staffing needs, implementation roles, and a timeline necessary for full implementation of all action items. The *Yahara CLEAN Strategic Action Plan for Phosphorus Reduction* addresses fourteen specific actions for a 50% reduction in the average annual phosphorus load from direct drainage sources in the Yahara chain of lakes.
B. Collaborate using an adaptive management planning framework as a way to implement both the *Yahara CLEAN Strategic Action Plan* and to work towards permit compliance for regulated entities such as the Madison Metropolitan Sewerage District. Nutrient and sediment loading to the Yahara lakes should be reviewed and action plans adapted as needed to meet the twin goals of healthy farms and healthy lakes, with a maximum period between reviews of 10 years. This planning should be informed by the aggregated data provided by the nutrient management database (goal 4), priorities identified by watershed modeling (goal 8) and relevant water quality data.
C. Continue to work with full implementation of the Yahara WINS adaptive management project with the Madison Metropolitan Sewerage District and other partners.
D. Document progress towards meeting Rock River TMDL (WDNR is already tackling this) and other community goals to protect water quality:
    i. Progress towards Rock River TMDL targets and compliance with Agricultural Performance Standards (NR151 ATCP 50)
    ii. Progress towards Yahara CLEAN goals (separated out by recommended actions and practices)
    iii. Progress towards Yahara WINS targeted reductions

6. Develop and implement programs that aid in the preservation of agricultural land.

Recommendations

A. Develop a county wide agricultural conservation easement program to:
   i. Ensure agricultural viability
   ii. Provide financial support that will encourage conservation practices not easily covered by existing cost-share programs
   iii. Maintain and monitor compliance with state performance standards or other conservation goals
B. Continue support for the Dane County Farmland Preservation Program, which allows farmers and landowners to be eligible for state tax credits under the Working Lands Initiative by maintaining land in agricultural uses.
C. Encourage the development of Agricultural Enterprise Areas (AEAs) in areas of the county not covered by County or local zoning. AEAs are community led efforts to establish designated areas for continued long-term agricultural production and investment in the agricultural community. Landowners in AEAs are eligible to enter into voluntary farmland preservation agreements with Wisconsin Department of Agriculture Trade and Consumer Protection and claim tax credits.
D. Encourage the preservation of agricultural land within urban areas.

7. Expand implementation of conservation practices through streamlined cost-share program administration, new program development and improved promotion of opportunities.

Recommendations

A. To assist with public awareness and validation, stakeholders should partner with the University of Wisconsin and other scientific experts to model nonpoint pollution reductions from conservation practices.
B. Evaluate and assess current cost share programs for their limitations in funding conservations practices and identify obstacles with program and individual contract administration that are burdensome to both landowners and administering staff.
C. Develop a Dane County agricultural cost-share guide to outline funding opportunities, procedures and policies for staff, program participants, policy makers and the public. Include information regarding:
    i. Funding opportunities
    ii. Application and planning procedures
    iii. Conditions and requirements for funding
    iv. Administrative procedures
D. Develop funding opportunities to assist landowners and producers with improvements to soil health such as cover crops, nutrient management plans, no-till planting, and other cropland conservation systems.
E. Consider an Agricultural Water Quality Grant program that provides funding opportunities for organizations or individuals for the implementation of conservation practices and systems beyond current cost-share and other existing funding opportunities.
F. Work with partners to support the implementation of a pay for performance pilot.
G. Explore the feasibility of new incentive programs such as incentives for submittal of nutrient management plans or other data.
H. Consider new revenue sources to cover proposed and existing programs.

8. Develop large scale watershed analyses to identify and prioritize high risk areas for phosphorus runoff and water quality degradation.

Recommendations

A. Develop a high level (macro scale) analysis for the entire county that quantifies the amount of phosphorus loading to nearby surface waters. Use the analysis to identify priority watersheds.
B. Develop a mass balance of pounds of phosphorus and types of phosphorus imported and exported annually by watershed and develop a long-range approach to address any imbalance.
C. Update the Yahara River Soil and Water Assessment Tool (SWAT) analysis to gauge progress. The SWAT model was initially conducted by Montgomery & Associates in 2010 as part of Yahara CLEAN and updated in 2014 for Badfish Creek.

Healthy Farms Healthy Lakes Task Force Members

Mary Kolar, Dane County Supervisor, District 1, Chair
Carl Chenoweth, Dane County Supervisor, District 35
Nikki Jones, Dane County Supervisor, District 28
Dave Fahey, Yahara Pride Farms Representative and Vice President, Monona Community Bank
Allan Levin, Yahara Lakes Association
James Tye, Executive Director of the Clean Lakes Alliance
Rob Klink, Agricultural Farm Advisor
Rebecca Larson, Biosystems Engineer at UW-Madison
Rebecca Power, Lakes & Watershed Commission
Dave Taylor, Former Director of Yahara WINS
Laura Hicklin, Director of the Dane County Land and Water Resources Department
Jamie Derr, Farmer and Owner of Derr Solarmass
Jim Matson, Retired former Wisconsin DATCP counsel