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OPPORTUNITIES NOW

An Analysis of Priority Issues and Actions
for Wisconsin's Natural Resources



2019
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Opportunities Now: An Analysis of Priority Issues and Actions for Wisconsin's Natural Resources 2019-2021

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Wisconsin's Green Fire is a statewide organization dedicated to supporting our conservation legacy by promoting science-based management of natural resources. Our members include career natural resource professionals and scientists from a variety of disciplines throughout Wisconsin.

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Photo by Bruce Neeb



INTRODUCTION

Wisconsin's clean water and clean air, expansive forests, prairies, and wetlands, and the fish, wildlife and biota associated with them – what we collectively call our natural resources - are an essential part of our identity as a state. Natural resources form the foundation for much of our economy, they support vibrant rural and urban communities, and they contribute to the health and well-being of Wisconsin residents and visitors. Our natural resources however are not fixed in time and they are not immune to stresses that result from environmental pollution, over-extraction, loss of habitat, or the many challenges associated with a changing climate. None of these threats are new, however the failure to adequately address them is leading to increasingly negative outcomes for a growing number of Wisconsin residents.

Opportunities Now summarizes major threats to Wisconsin's natural resources and identifies actions that will result in better conservation outcomes.

Opportunities Now looks at five priority issues:

- Water Pollution from Agriculture
- Groundwater Withdrawals
- Our Land and Water Legacy (Knowles - Nelson Stewardship Fund)
- Chronic Wasting Disease
- Climate Change

While these are important conservation issues in Wisconsin, they are clearly not the only critical environmental and conservation challenges facing the state, and not the only issues of concern to Wisconsin's Green Fire (WGF). We selected these five issues based on threats posed to Wisconsin's natural resources and specific opportunities that exist for state government actions.

Photo by Ron Eckstein

Wisconsin's Green Fire is uniquely positioned for this analysis. Formed in 2017, WGF is an independent organization comprised of natural resource professionals dedicated to promoting science-based management of natural resources. Our members include career natural resource professionals and scientists from a variety of disciplines throughout Wisconsin. *Opportunities Now* is a data-driven evaluation of threats and Wisconsin's current management response, informed by the professional experience of our members. *Opportunities Now identifies specific actions that can be taken at the policy, budget, and agency level of state government in 2019-2021. It also describes longer term directions needed for a healthy environment for Wisconsin's citizens.*

Because the Department of Natural Resources (DNR) is Wisconsin's lead natural resources agency, many recommendations focus on that agency, but we also highlight actions by other state agencies and entities with essential responsibility. We recognize that agencies work in the framework of budgets and staffing that is often not adequate to meet conservation needs.

For state agencies, we recommend actions with a high likelihood for successful implementation and a high potential for lasting impact. For policy makers, we identify priority needs for resources or policies that will allow for better conservation outcomes. For each issue we provide conclusions that describe long range directions to align needed actions with our science-based findings about threats and current conditions. Wisconsin's more than century-long tradition of conservation victories reminds us that great outcomes are possible with shared purpose. We believe that today can be another inflection point in our conservation history – where we collectively recognized our greatest assets and greatest threats, and we summoned the resolve needed to seize important opportunities.

Priority ISSUE

AGRICULTURAL WATER POLLUTION



Clark County, WI. Photo by Bruce Need

BACKGROUND

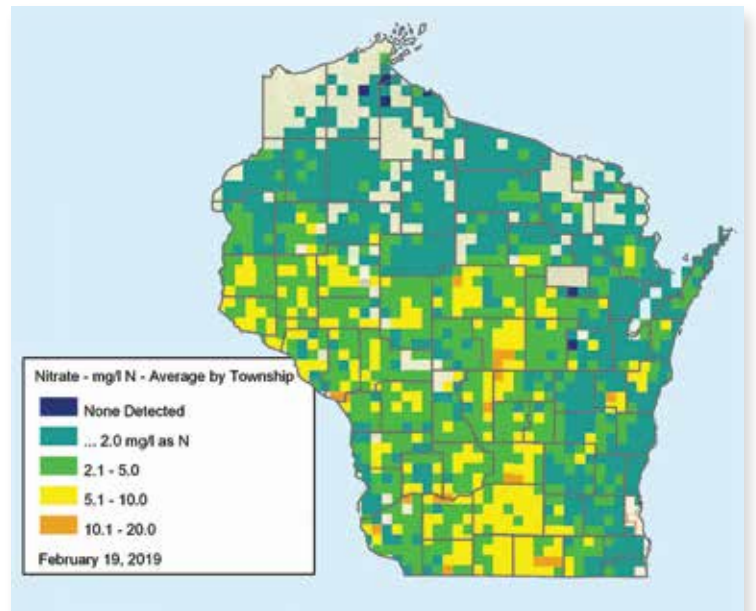
Wisconsin is the center of the finest freshwater resources in the world. Yet, an increasing number of Wisconsin residents and visitors are drinking and bathing in contaminated water that threatens their health and livelihoods.

Most farmers want to protect the environment and practice land stewardship. It is an unfortunate reality however that agricultural practices are a leading source of water pollution. A generation ago, Wisconsin successfully tackled what was once its most pressing water pollution problem - sewage from municipalities and wastewater from industry (point source pollution) using authority under the federal Clean Water Act. In contrast, the mix of voluntary approaches, incentives, and limited regulations to address water pollution from agriculture are not improving water quality, and in fact we are moving backward on an issue that affects more Wisconsin residents every year.

Agricultural producers use phosphorus and nitrogen fertilizers as well as animal manure to maximize crop yield.

The estimated 1.279 million dairy cattle currently in Wisconsin generate about 28 million tons of manure per year (UWEX). The organic pollution potential of that amount of waste is more than four times greater than the waste generated by Wisconsin's 5.8 million people.

Most of this manure is spread on fields near dairy operations where it is generated. Runoff from rainfall and snowmelt can carry excess nutrients, soil, and pathogens to streams and lakes, which can experience algae blooms, loss of oxygen, shifts to undesirable species, and bacterial contamination. Likewise, nutrients and



Nitrate in Wisconsin's Groundwater. The drinking water standard is 10 mg/l. Health effects start at 2.5 mg/l. WI Well Water Quality Viewer pathogens can seep into the groundwater, contaminating drinking water.

A broad range of pollutants enter water supplies from nonpoint sources. Nitrates and phosphorous from chemical fertilizer and manure spreading, and pathogens such as coliform bacteria from manure are some of the most wide-spread pollutants. Nitrogen and coliform bacteria carry significant human health risks. High phosphorous levels create a wide range of impacts to aquatic ecosystems including algae blooms that can make water unusable for recreation, and some forms of which directly threaten human health. Other emerging contaminants of significant concern include per and poly

fluoroalkyl compounds (PFASs) that result from industrial activities, which we do not address here.

Wisconsin's 2018 Water Quality Report to Congress

describes the impacts from nutrient runoff and other contamination sources to lakes, rivers, and streams.

Nonpoint water pollution, primarily from agricultural sources, is the most frequent cause of impairment for all waters in Wisconsin. There were 1,295 Wisconsin waters considered impaired prior to 2018, and in 2018 the department proposed adding 240 new waters to the impaired list.

Most regulated industries and municipalities have long-since reduced pollutants under Clean Water Act requirements to the extent that further reduction in these sectors alone will have marginal effects on water quality compared to reductions from non-point sources. Despite the current blend of voluntary practices and regulated activities that address agricultural pollutants, water quality in many areas of Wisconsin continues to be impacted by agricultural sources.

[The Southwest Wisconsin Groundwater and Geology Study](#) (Wisconsin Geologic and Natural History Survey, 2018) found that over 42 percent of 301 randomly selected wells in Grant, Iowa, and Lafayette counties were considered unsafe because they exceeded the health-based standards for either total coliform (34%) or nitrates (16%). A similar 2015 WGNHS study found that over 34% of wells in Kewaunee County either exceeded the nitrate standard or contained bacteria at levels in excess of safe thresholds. Statewide data reported by the **Groundwater Coordinating Council indicate** that these results are not unique.

AGENCY ACTIVITIES

Joint Agency Responsibilities

The DNR is Wisconsin's primary water quality agency and is delegated by the US Environmental Protection Agency (EPA) to carry out the federal Clean Water Act. Implementation of agricultural performance standards requires development of conservation practices by the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), which also supplies funding and technical support for practices. The delivery of funding and technical support to farm producers is accomplished by county land conservation departments in partnership with the federal Natural Resources Conservation Service (NRCS), and supported by a combination of state and federal funding for farms operating under DNR-approved land and water plans. *Successfully protecting public water supplies requires*

extensive cooperation between DNR, DATCP, NRCS, and all county land and water departments.

CAFOs

Wisconsin animal feeding operations with 1,000 animal units or more (Concentrated Animal Feeding Operations or CAFOs) require a permit from DNR to operate. Permit requirements include nutrient management plans, manure storage standards, and spill response plans. DNR inspects facilities and may take enforcement actions for violations and can require a permit for smaller facilities if it finds a discharge to navigable waters or contamination of a well.

Non-CAFOs

Most smaller farms that fall below CAFO thresholds aren't required to have a permit, are subject to limited oversight other than when requesting voluntary assistance, and generally cannot be compelled under current rules to use conservation practices unless the state and county offer cost sharing to implement them.

County land conservation departments are the primary government conservation agency working with producers on conservation practices to comply with agricultural performance standards. In practice, county staff also work closely with federal NRCS staff in delivering services to farmers.

The availability of cost share funding has a strong influence on agricultural water pollution. Cost sharing helps farmers with the initial cost of implementing practices, but once practices are established, farmers are generally expected to maintain the practices without further cost sharing. Conservation practices are frequently abandoned when cost-share contracts end, or when farms change hands or operations change.

Nutrient Management Plans

Nutrient management plans address application of manure and commercial fertilizers, including the rate, method, and timing, to minimize nutrients entering groundwater and surface water. All CAFOs are required to develop and follow nutrient management plans to minimize water pollution and they do not generally receive government cost sharing for necessary practices. For non-permitted farms, nutrient management planning is a conservation practice eligible for cost share. According to the **2019 Legislative Fiscal Bureau Report**, DATCP estimates approximately 3.35 million acres or 37% of Wisconsin's harvested cropland was under nutrient management planning in 2018. CAFOs make up about 1.08 million acres of the total.

ADMINISTRATIVE DIRECTION

Public Transparency

Despite the importance of water quality to the personal and economic health of Wisconsin, DNR does not report specific measures of agricultural water quality to the public. DNR reports performance measures, mostly related to permit approvals and other customer-focused metrics, in the **Enterprise Dashboard** and the agency's **Biennial Budget**. These measures do not address nonpoint sources of pollution to drinking water or surface water.

In 2016, the **Wisconsin Legislative Audit Bureau** (LAB) reviewed DNR's wastewater programs, including CAFOs and permit compliance, a program audit requested by legislators after the reported at least 64 deficiencies in Wisconsin's oversight of municipal, industrial, and CAFO waste permitting programs. For the CAFO program, the LAB report noted inadequate staffing, incomplete record keeping, and a level of permit oversight, including a frequency of field inspections that were consistently below the agency's own goals.

Since 2016, the DNR has made substantial progress in addressing both the deficiencies noted by EPA and the recommendations in the LAB report. It is unlikely however that these actions alone can mitigate the increasing extent of water impairment resulting from current non-point activities.

In addition, legislation passed in the Extraordinary Session of December 2018 is expected to force the rescission of a substantial amount of internal agency guidance throughout most state agencies as soon as May 2019.

In the case of the wastewater program, the 2018 change in law may limit the ability of the DNR to take effective actions to address the agricultural pollution issues.

STAFFING AND BUDGET

In response to the **Legislative Audit Bureau**, DNR reallocated four full time employee (FTE) positions to the CAFO program from other positions, raising full program staffing to 21 FTEs and reducing the ratio of CAFO permits per staff person to about 20:1, which the agency indicates is the minimum staffing needed to handle permitting and compliance activity. This minimum staffing level does not however provide for increased inspection, spill prevention and response, or increased

effort to identify smaller facilities with discharges, nor will it help the department work with smaller facilities to protect water quality. The minimum staffing can only function adequately if DNR can effectively train and retain staff.

Inspections provide the oversight to enforce the law. The DNR goal has been to inspect CAFOs at least twice in a five-year period. The **Legislative Audit Bureau** found that while the number of CAFO inspections increased, the percentage of CAFOs inspected twice within a five-year period has never exceeded 48%. Maintaining a target inspection rate is critical to ensure that facilities and practices are in place to avoid fertilizer or manure spills and to comply with nutrient management plans intended to avoid pollution.

Public Funding

The amount of public funding needed to allow full implementation of pollution control on all agricultural land would be difficult to estimate, however reasonable increases in staff and investment in scientific analysis and information technology will enable improved data collection and analysis, speed technology transfer through the agriculture industry, and facilitate pollutant reductions. Likewise, increases in state investment in county support and cost share dollars would help reduce nonpoint source pollution. According to the 2019 Legislative Fiscal Bureau Report, the 2019 Joint Allocation Plan Awards from DATCP and DNR for nonpoint source grants, cost share, and county staffing and support total nearly \$21 million.

A key practice to reduce contamination of surface and groundwater is nutrient management planning, which is a requirement of all CAFO permits. Wisconsin requires that all other farms develop and follow nutrient management plans, however compliance is contingent on providing cost-share funding for approved practices. The **Legislative Fiscal Bureau Report** estimates that at current cost-share rates, it would take at least \$14 million in statewide cost-share funding each year, for 20 years to establish basic nutrient management plans for farms that are not implementing a nutrient management plan, although other experts have suggested this number could be as high as \$20-40 million per year. We do not have an estimate of the additional cost-share funding that would be needed to implement more rigorous nutrient management practices, beyond what

is currently required by state standards. Higher per-acre cost-share rates might encourage more voluntary farmer participation, but would require more funding to cover an equivalent number of acres.

Permit Fees

CAFOs pay an annual flat permit fee of \$345, from which the DNR retains \$95, with the remainder going into the state's General Fund. Even the smallest CAFOs generate waste equivalent to a small city, however cities or sewerage districts pay substantially more (in many cases more than 100 times more) for their wastewater permits based on the volume of discharge generated, even though the DNR has comparable oversight costs for CAFOs. According to **WGF analysis**, CAFO fees in total supported less than 3% of program costs in 2015. In contrast, Wisconsin industrial and municipal discharges pay more than 60% of program costs through permit fees.

Taxpayers are currently funding most of the effort required to oversee the CAFO program. Other DNR programs are understaffed as a result of oocations needed to manage the program at an effective level.

CONCLUSION

To protect drinking water and lakes and streams, Wisconsin needs a concerted initiative to address pollution from non-point sources, including agriculture. The growing concentration of larger farm operations, together with effects of more frequent intense precipitation patterns are almost certainly contributing to the increased water pollution observed under the management policies and resources in place today.

If we are measuring success in our water protection efforts by the number of impaired waters or contaminated water supplies, then the existing incentive-based systems for improving practices and limiting nutrient runoff is failing.

It is doubly unfortunate that our waters are becoming increasingly contaminated at the same time that economic trends in agriculture are putting increasing pressures on small farms, driving more producers out of business, and leading to continued farm consolidation.

It is understandable that policy makers are reluctant to increase the regulatory burden on farmers, especially

small producers, when thousands of farm families are losing money in current markets.

To be successful, Wisconsin's agriculture community will need to be a key player in developing new options and improving upon existing programs.

The passage of the Clean Water Act in the 1970's led to groundbreaking changes in practices that reduced point source pollution from industrial and municipal sources. Similar success is possible in non-point source pollution if we are willing to make similar investments in technology, innovation, and apply appropriate standards. Wisconsin has a combination of approaches already in place, but they are not achieving the goal of protecting Wisconsin's public health and environment. *In particular, new solutions for protecting water quality need to reflect both the growing size of farm operations and the impact of increasingly intense weather events on water resources.*

Meeting this goal will require adaptive implementation based on known science and filling in needed information gaps. Practices that maintain productivity while reducing nutrient losses need to be in wider use. In particular, more effective nitrogen loss reduction practices need to be used, especially in sensitive areas or where drinking water supplies are threatened.

Long-term success in conserving clean water in farm country will require a suite of efforts that:

- Strengthen the regulatory structure and oversight for the largest farm and dairy operations to a level appropriate for their size and scale.
- Promote research and development, commercialization, and policy changes needed to facilitate widespread adoption of manure treatment and management technologies such as biodigesters, to prevent environmental impacts from excess nutrients and pathogens.
- Make an increased and sustained investment in farm conservation practices and technical assistance for farms of all sizes and environmental monitoring.

RECOMMENDED ACTIONS 2019-2021

Policy Recommendations

- It is time for a sustained collaborative effort with the agriculture community, together with federal, state and county agencies, the University of Wisconsin, and conservation stakeholders to recommend new policies and strategies to protect drinking water and public health.

Budget Recommendations: Increase Investment in Compliance and Incentives

- Increase annual segregated funding from the DATCP Soil and Water Resources Management Program budget for county conservation staffing and support grants.
- Increase cost-share grant funding for agriculture runoff projects above the current \$3.5 million.
- Secure permanent staffing for the DNR CAFO program above the minimum levels recommended by the 2016 Legislative Audit Bureau report, reflecting continued industry expansion and needs for improved compliance.
- Increase CAFO permit fees to better reflect actual costs of program oversight, and allow the permit fees to fund the DNR CAFO program. Consider tiered rates based on size of facility.

Agency Recommendations: Update Tools and Standards

- DNR, DATCP and their partners at the federal, state, and county level need to collaborate more effectively in the field and at the leadership level in order to assure development of technical standards, apply science-based tools, and ensure effective resource and staff utilization for agriculture programs.

In particular, agency collaboration outcomes include:

- Priority issue coordination and resource alignment needs should occur continually between agency Secretaries and their deputies.
- Joint technical standards teams need to assure all partners are contributing to consistent and timely development of technical standards that reflect current practices and environmental conditions.
- Joint development of technical tools such as SNAP plus (Soil Nutrient Assessment Tool) for managing nutrient inputs.
- All agricultural or livestock operations, regardless of size, are required to report manure spills that may affect Wisconsin's waters to the DNR Spill Emergency Hotline, however field reports indicate that many manure spills are not reported. Department staff should aim for more complete compliance in spill reporting, and make spill information available to the public.

Priority ISSUE

GROUNDWATER WITHDRAWALS



Photo by George Kraff. Huron Lake, November 2012

BACKGROUND

Wisconsin is in a region of abundant fresh water, but we are experiencing a level of water withdrawal that is limiting water availability in some areas and is creating a growing number of environmental impacts and user conflicts.

Water for human use is taken from groundwater, rivers, and lakes for purposes that include residential and municipal water supplies, industrial uses, and agricultural uses – primarily for crop irrigation and dairy and other livestock. Groundwater withdrawals in parts of Wisconsin have resulted in substantially reduced streamflows and lake levels and have *drawn down* (the pumping induced reduction in groundwater levels) groundwater levels regionally. These are long-observed impacts that have been documented for three or four decades in some areas. Wisconsin's **Groundwater Coordinating Council** reports that long-term drawdowns of more than 150 feet have been observed in the Lower Fox River Valley and southeastern Wisconsin. The level of drawdown in parts of Dane County has been around 50 feet. Drawdowns are usually an overall lowering that affects the naturally fluctuating groundwater levels that occur from season to season. In addition to known environmental impacts, excessive drawdowns can also cause reduced yields in nearby wells.

Both research conducted in the 1960s by **Weeks, et.al.** as well as current forensic hydrology by **Bradbury, et. al and Kraff, et.al.** identify pumping-induced water level and streamflow impacts in Wisconsin going back more than 50 years. Water level drops induced by pumping during a modest dry spell in years 2005-2010 brought the pumping issue to the forefront of public discussion. In the Central Sands Region, the water level during that period dropped substantially in many lakes, streams, and wetlands, to the point of shrinking the water body or going dry. Notable

examples of impacted lakes and streams are the Plainfield area lakes, Hancock area lakes, Portage County's Pickerel and Wolf Lakes, Adams County's Patrick Lake, the Little Plover River and Stoltenburg Creek. Long Lake in the Central Sands Region has declined from an average of 12-feet deep to completely dry, destroying a trophy bass fishery and diminishing property values and property taxes. Groundwater pumping reduced flow in the Little Plover River, a cold water trout stream, to the point of drying in some years.

As a result of decreased lake levels and stream flows in affected areas, deeper water bodies may have experienced water level losses and wider beaches, while shallower lakes may have reverted to wetlands or completely lost shallow water habitat. Some wetlands have dried completely, and fish kills as a result of drawdowns have been documented. Surface water losses affect the public by impacting outdoor recreation, fishing, and waterfowl hunting. Chronic water drawdowns ultimately affect property values and may result in a shift in property tax burden, for example as former lakeshore properties become unusable.

US Geological Survey's nationwide review determines that flow alterations are a primary contributor to degraded river ecosystems and lead to the loss of native, threatened, and endangered fish and invertebrate species whose survival and reproduction are tightly linked to specific flow conditions. Altered flows affect water quality, water temperature, water availability for agricultural, municipal, and industrial uses, recreational opportunities, and sport fish populations. For example, in streams with severely diminished flow, native trout, which require cool, fast-flowing streams with gravel bottoms, are replaced by less desirable species such as carp.

While today's prominent threats are somewhat localized, Wisconsin DNR's annual **Water Use Report** shows how water use in Wisconsin is generally increasing and changing over time. Municipal, agricultural and industrial users have alternately used the most water over the past several years. New high capacity wells continue to be drilled throughout the state, primarily in response to crop needs and expanding farm operations.

In just the six county Central Sands Region, the number of high capacity wells has increased from fewer than 100 in the early 1950s to more than 3200 permitted wells today.

AGENCY ACTIVITIES

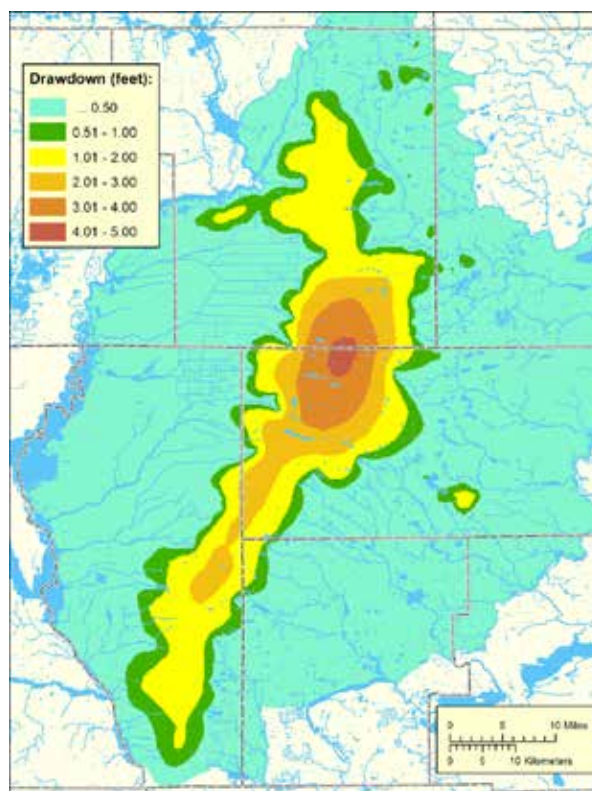
A Wisconsin DNR approval is necessary for the construction or operation of a high capacity well system, school well or wastewater treatment plant well. A high capacity well is defined as a single well capable of withdrawing more than 100,000 gallons per day, or a well that, together with all other wells on the same property, has a capacity of more than 100,000 gallons per day. [See Sections NR 812.09(4)(a) & (b), Wis. Adm. Code.] The DNR's Water Use Section in the Bureau of Drinking Water and Groundwater reviews and decides on the prior approvals required for high capacity wells, along with additional activities related to water use. See <https://dnr.wi.gov/topic/WaterUse/>

For agricultural water withdrawal from streams, state law requires DNR to evaluate data about the water quantity and quality, fish and wildlife, along with any navigational use to determine the water volume and flow pattern needed to maintain the natural features. Then, DNR determines whether any remaining water is "surplus," that is not authorized for use by other waterfront landowners. If surplus water is available, a new withdrawal can be approved. Public notice and an opportunity for public hearing are part of the review process.

ADMINISTRATIVE DIRECTION

The DNR's scope of authority over groundwater uses, and especially its duty to consider the cumulative impact of groundwater withdrawals, has been an issue of controversy for some time.

In 2011 the Wisconsin Supreme Court appeared to clarify this issue with their ruling in *Lake Beulah Management District v. DNR*, a Wisconsin Supreme Court



Water Table Drawdown in the Central Sands Region

decision which held that the DNR had a constitutional responsibility to consider surface water impacts when reviewing permits for high capacity wells.

DNR procedures for review of high capacity well permits changed again in mid-2016 however in response to an opinion issued by Wisconsin Attorney General Brad Schimel. The Schimel opinion contradicted the Supreme Court's interpretation in *Lake Beulah*, arguing that the Supreme Court did not take into account the newly enacted 2011 Act 21, which prohibited the DNR from imposing any condition not explicitly allowed in state statute or rule.

In his ruling Schimel stated, "I have determined that the Supreme Court did not address the newly enacted Act 21 in *Lake Beulah Management District v. Department of Natural Resources*. *Lake Beulah*, 335 Wis. 2d 47. I further conclude that neither Wis. Stat. ch. 281, nor the public trust doctrine give DNR authority to impose any condition not explicitly allowed in state statute or rule. In addition, no other authority exists which permits DNR to impose the conditions enumerated by the Assembly."

Unlike court decisions, Wisconsin Attorney General opinions are not binding. However following a review of the opinion, the DNR determined that it would adhere to the opinion, and going forward began limiting its review and application of approval conditions. The DNR's

chief legal counsel said at the time that the agency has historically followed Attorney General opinions. The 2017 Wisconsin Act 10 contains several groundwater pumping provisions, most notably making high capacity well approvals effectively permanent and allowing high capacity well approvals to be bought and sold with property.

The limitations imposed by the previous administration on DNR's authority to manage groundwater prevent Wisconsin from protecting the public interest in waters of the state. Excessive groundwater withdrawals are depleting lakes and streams, causing environmental damage and creating economic impacts for other users.

In 2017, the legislature also directed the DNR to conduct a study of three named lakes, as well any other navigable stream or navigable lake the DNR deemed appropriate to include, located in three watersheds in Adams, Portage, Waushara, and Wood counties. The purpose of the study was to determine the potential for significant impacts to average seasonal water levels as a result of groundwater withdrawals. That study is still ongoing, however the DNR has chosen to limit the study to only the three named lakes, despite requests that other water bodies within the defined study area (and authorized to be studied by the legislature) be included.

Transparency

The Enterprise Dashboard and Biennial Budget report on DNR's objectives related to high-capacity wells include permit processing times and inspection of at least 10% of wells during construction (after water use quantities have been established).

No agency metrics currently address the cumulative impacts of extensive water use and the environmental and property rights impacts associated with ground water drawdowns.

STAFFING AND BUDGET

Budget resources allocated for water use have remained generally constant since 2017. With the reduced level of review for high capacity wells, some staff time has been redirected to work on groundwater studies. As of 2019, five experienced hydrogeologists and specialists, and a hydrogeologist supervisor, are on staff.

CONCLUSION

Wisconsin is one of the freshwater capitals of North America, however even our relative good fortune in

available water has limits. In order to ensure equitable access to water for the benefit of all Wisconsinites, we need to manage groundwater withdrawals to minimize reductions in stream flows and lake levels and protect public rights. We face an increasing risk that currently permitted water withdrawals exceed the available supply of water that can be withdrawn without causing surface water impacts.

The DNR retains the trained and experienced hydrogeologists and reasonable budget to resume review and condition approvals that would help prevent groundwater pumping-induced reductions in stream flows and lake levels that harm navigation, water quality, fish and wildlife habitat and populations. Progress needs to continue to complete hydrogeologic studies and refine techniques to assess groundwater pumping impacts.

For the future, Wisconsin needs to prepare for new water uses, and face the prospect of more shortages and drawdowns, which will become even more severe during droughts. Currently, the DNR lack of authority to allocate water when supplies are limited, and the interpretation of current law not to consider cumulative uses when approving water withdrawal permits is leading to increasingly compromised water supplies. This situation sets up the risk for even more severe impacts to fellow-water users as well as fish, wildlife, and aquatic communities that depend on water.



Lake Jacqueline, Photo by Bruce Neeb

Reliance by the DNR on the former Attorney General's 2016 opinion, which conflicts with recent decisions by Wisconsin courts, is limiting the DNR's ability to properly manage groundwater to ensure protection of Wisconsin's public trust waters.

RECOMMENDED ACTIONS 2019-2021

Policy Recommendations

Wisconsin needs a statewide policy framework established in legislation that provides clear guidance to assure that:

- Groundwater and surface water are determined to be interconnected waters of the state, and private or public uses of those waters may not individually or cumulatively impair those waters, unduly harm the rights of other water users, or cause undue environmental impairment or damage.
- Best available scientific methods and data are used to determine the amount of surface and ground water that may be sustainably withdrawn.
- Authority is established to allocate water withdrawals among users giving priority to community and residential needs.
- Clarify DNR's authority to prohibit or condition a withdrawal to ensure that a withdrawal does not injure public waters of the state.
- Sustainable and equitable management of surface and ground water are based on scientific methods and the best available data to determine the amount of water available for withdrawal on a sustainable basis.

Agency Recommendations:

- The DNR should apply and adapt scientific tools to determine reasonable use of groundwater, determining sustainable amounts that protect public rights in navigable waters.
- The DNR should develop goals and objectives along with measures reported to the public regarding sustainable water use. .
- The DNR should exercise its authority to prohibit or condition a withdrawal to ensure that it does not injure public waters of the state.
- The DNR has a long-standing role in promoting and assuring adherence to the Public Trust Doctrine regarding state waters. The DNR should train staff and educate the public about the history, value, and application of the Public Trust Doctrine

Priority ISSUE

OUR LAND AND WATER LEGACY



Photo by Gary Nski – Good Ideas Company, LLC

BACKGROUND

The Value of Outdoor Recreation

Did you walk, or bike ride, picnic or paddle, hunt or fish, or just enjoy a good time outdoors with family or friends recently? If so, you're in good company. 95% of all Wisconsin adults participated in some outdoor activity last year according to Wisconsin's new [Statewide Comprehensive Outdoor Recreation Plan \(SCORP\)](#).

Clean air, clean water, natural habitats, and diverse outdoor spaces are part of Wisconsin's identity. Providing recreational access and a broad array of quality outdoor experiences for Wisconsin residents and visitors is good for our economy and good for quality of life in our communities.

The Outdoor Industry Association estimates that consumer spending on outdoor recreation in Wisconsin totals \$17.9 billion annually, resulting in 168,000 directly-related jobs, \$5.1 billion in wages and salaries, and \$1.1 billion in state and local tax revenue.

Our tourism sector in Wisconsin relies heavily on visits and recreation in outdoor places ranging from the lakefront in Milwaukee, to Devil's Lake State Park, the Eroy-Sparta trail, and the Northern Highland-American Legion State Forest. Wisconsin has over 1.5 million acres of state lands available for outdoor activities. Parks and nature preserves, wildlife areas and refuges, forests and trails connect people to nature. These places, from small neighborhood parks to expansive national, state and county forests are the stages on which we enjoy the outdoors, improve our health, protect our air and water, and support vibrant communities of all sizes.

Changes in where and how Wisconsinites live, work and play are affecting our state's landscapes, according to Wisconsin's **Land Legacy Report**. Wisconsin's land acquisition and outdoor recreation policies must adapt now or lose critical opportunities. It is important to provide outdoor recreation opportunities close to urban areas and reach younger and under-served people.

The Stewardship Program

Wisconsin citizens continue to support funding for land, water and wildlife conservation. In fact, nearly 90% of all Wisconsinites support continued investments in conservation according to the **Wisconsin Conservation Survey**. Four-in-five voters surveyed would tell their legislator to continue conservation investments through the Stewardship Program.

Wisconsin's flagship program for land acquisition and development, the Knowles-Nelson Stewardship Fund, expires in 2020.

Since its establishment in 1989, the Stewardship Program has been Wisconsin's primary tool for land conservation and development. Its creation was the result of legislative review of the state's efforts to acquire and protect recreation and environmentally sensitive lands. Stewardship funding, often leveraged with federal or private funds, has protected more than 669,000 acres of state lands, including many of Wisconsin's most beautiful and ecologically significant lands and waters. Projects have ranged from 100-square-mile purchases such as the Wild Rivers Legacy Forest in northeast Wisconsin to 1-acre additions to the Hank Aaron State Trail in Milwaukee.

Wisconsin has invested over \$1.2 billion in the Stewardship Program since its inception. The Stewardship Program's conservation and recreation goals are achieved through fee acquisition of lands, purchase of easements, development of recreational facilities, and restoration of wildlife habitat. Stewardship supports acquisition and recreation projects on state land, county forests, and municipal lands. It also funds land trust projects to protect private conservation lands.

Now is the time to continue land purchase, diversify our acquisitions for the future, and continue investment in updating and repairing our array of lands and facilities.

Maintenance of Public Recreation Facilities

Unfortunately, Wisconsin is falling behind in maintenance of public lands and facilities. Although many recreation facilities are modest in design and scale, they require ongoing maintenance to remain safe, useable and enjoyable. Leaky roofs, pot holed roads, outdated bathrooms and showers, and trails that are poorly maintained are just a few examples. As the capital maintenance backlog continues to grow, the condition of developed facilities such as roads, trails, and shelters will continue to deteriorate. In 2017, all projects supported with federal Land and Water Conservation Fund grants on state properties involved repair or renovation of existing facilities according to **SCORP**. In addition, there are increasing needs to deal with invasive species and forest health threats from insects and diseases on public lands. Climate change may be accelerating these trends.

We need to re-invest in our public parks and land facilities now to avoid higher costs later and maintain the critical services these lands provide. *The quality of outdoor experiences and the ability of our lands and waters to support sustainable populations of fish and wildlife require our investment in careful land stewardship and restoration activities.*

Managing Flood Risks

Extreme precipitation and flooding events have affected almost every region of Wisconsin in recent years and the severity and damage caused by flooding is increasing. Conservation lands such as wetlands store water during precipitation events – potentially reducing flooding and property damage. Protecting wetlands and undeveloped lands is a cost effective strategy to help reduce flood damage and costs.

Acquisition or protection of wetlands and strategically located lands for water storage should be an important part of community strategy in preparing for the continued impacts of climate change.

Public Access on Private Forest Lands

Between 1999 and 2015, global economic trends prompted Wisconsin forest products companies to sell most large blocks of industrial forest to investor-owned Timber Investment Management Organizations and Real Estate Investment Trusts. Working forest conservation easements funded by the Stewardship Program have been used successfully to help keep industrial forests in forest production and to provide public access to certain private forest lands.

AGENCY ACTIVITIES

The DNR administers the Stewardship Program and is the primary state agency assigned the duty of selecting, acquiring and managing state recreational lands. The State of Wisconsin owns and the DNR manages 1.5 million acres across the state. Properties range from small boat launches to the 232,000-acre Northern Highland American Legion State Forest.

In addition to state-owned lands, the DNR currently holds conservation easements on over 330,000 acres in other ownerships. Easements provide public access on large blocks of privately-owned working forest in northern Wisconsin. State easements along streams and rivers provide fishing opportunities and protect critical streambank habitats. State owned natural areas provide a portfolio of lands with minimal development to preserve remnants of old forests, rock formations and similar natural communities and rare natural features.

With exceptions for ecologically sensitive habitats, lands protected with Stewardship funding – whether public or privately owned - are open to public access for what is defined as "nature based outdoor activities," which include hunting, fishing, trapping, hiking, or cross-country skiing.

ADMINISTRATIVE DIRECTION

The most recent strategic direction for conservation land acquisition was completed by the DNR and approved by the Natural Resources Board in 2010.

The Stewardship Program has been supported by state-issued general obligation bonds with varying levels of spending authority since the program's inception. In the most recent Stewardship re-authorization in 2007 annual bonding authority was increased from \$60 to \$86 million annually. In state budgets since 2011, annual bonding authority has been reduced: the 2017-2019 state budget set annual spending at \$33.25 million, the lowest level since before 1999.

In the 2017-2019 biennium, the Stewardship Program was funded at \$33.25 million annually (Legislative Fiscal Bureau, Information Paper #61), *subject to an allocation in sub-programs as follows:*

\$9 million	for DNR property acquisition (2/3 must be for conservation easements, 1/3 can be for fee ownership purchases)
\$7 million	for grants to nonprofit conservation organizations
\$5 million	for grants to county forests
\$2.5 million	for recreational boating aids
\$6 million	for local assistance grants sponsored by local governments
\$3.25 million	for DNR property development
\$500,000	for motorized trail development

The general obligation bonds that provide Stewardship funding are re-paid by the state over time. The annual debt service costs for Stewardship bonding vary from year to year but are budgeted at \$82.9 million for 2018-2019. Since at least 2007, segregated funds from the state's Forestry Account have funded \$13.5 million in Stewardship debt service, with the balance of debt service costs coming from the General Fund. The 2017 state budget however eliminated Wisconsin's constitutionally approved Forestry Mill Tax, the largest historical source of funding for the Forestry Account.

In recent budgets there has been reduction in funding for the Stewardship Program, and indications of reduced support overall for public land acquisition and development. Beginning in fiscal year 2011, the legislature prohibited carryover of unobligated Stewardship funds from one fiscal year to the next. Since many Stewardship projects require multiple years of development to bring to completion, this provision effectively reduced spending below the maximums authorized for the program.

In 2013, Act 20 directed the DNR to identify non-essential lands outside of existing master plan boundaries and offer

a minimum of 10,000 acres of state-owned lands for sale. As of 2016 the Natural Resources Board had approved 10,275 acres of such land sales, the proceeds of which are directed to be used to repay debt of federal obligations associated with the properties, or to repay principle of bonds used for Stewardship funding.

Current law, as amended in 2011 and 2015, requires the DNR to submit all Stewardship projects over \$250,000, and most projects north of State Highway 64, to the Joint Committee on Finance (JFC) for a 14-day passive review. The chairs of JFC may call for a hearing during the 14-day passive review period, for which a majority vote of the committee is required in order for the project to proceed. The current procedure for JFC review of Stewardship projects, especially those projects for which some restrictions on Nature Based Outdoor Activities may be warranted has discouraged applications for projects on private or public lands where even partial restrictions on public access may be warranted, in many cases resulting in lost conservation opportunities.

The recent change in funding for state parks also affects public lands. The 2015-2017 **Biennial Budget** cut general purpose tax revenue from the state parks budget, making the parks system currently rely almost completely on user fees.

STAFFING AND BUDGET

In its **Stewardship Overview 2019-2021**, DNR estimated a total of \$550 million in backlogged development needs on all state properties, including \$200 million needed in state parks improvements. The 2017-2019 Stewardship Program budget allocated \$3.25 million to meet those needs through the DNR Property Development. When the last **Managed Lands Needs Assessment** was done in 2009, the annual resource gap totaled \$15 million, with a land management expenditure at \$18 million and an identified need of \$33 million. Since 2009, the gap has only increased.

The federal Land and Water Conservation Fund provided \$2.9 million for 2019 to support Wisconsin recreation facilities including trails, picnic shelters, and athletic fields as well as facilities such as splash pads, dog parks and skate parks.

Increased bonding from a re-authorized Knowles-Nelson Stewardship fund could fund more of the current backlog of property development needs, however the current need is far in excess of even the highest historical funding levels for Stewardship bonding.

CONCLUSION

As Wisconsin approaches the 30-year anniversary of the Stewardship Program, public support for protection and improvement of conservation land remains strong. Wisconsin residents and visitors all benefit from the opportunities provided by our investments in public properties and conservation lands. *The Stewardship Program authorization expires in 2020 and the program will need to be re-authorized in the current state budget to continue.* The debt service costs on bonding related to the Stewardship Program reflect a growing need for dedicated revenue that could provide stable program funding.

Protecting conservation lands to protect water quality and help protect communities from flooding is a growing priority that warrants increased emphasis. It is also important to address the backlog of land and facility maintenance needs on public lands.

In order to renew Wisconsin's tradition of ensuring public access to outdoor recreation for all and protecting scenic and environmentally sensitive land, it will be important to continue to build a new statewide consensus on land and water conservation.

Traditional outdoor user stakeholders will need to be joined by new partners including younger and more diverse users and residents in historically under-served communities; collectively this group of stakeholders will create a powerful constituency.

RECOMMENDED ACTIONS 2019-2021

Budget Recommendations

- Reauthorize the Knowles-Nelson Stewardship Program and substantially increase total annual funding to address current needs and emerging priorities.
- Clarify authorization for the state and local units of government to prioritize use of Stewardship funds for acquisition/protection of lands to protect municipal water quality and reduce flooding.
- Restore flexibility for the DNR to carry forward unobligated funds from one year to the next, or to transfer unused funds from the Land Acquisition sub-program to the Property Development and Local Assistance subprogram. Provide at least \$14 million for the state parks and lands development category to help address critical upgrades to park and land facilities and reduce the capital needs backlog.
- Allow the Wisconsin state parks system flexibility to spend surplus revenue in their segregated accounts. Parks have continually produced surplus revenue over the past five years due to increased attendance and through market pricing of campsites.

Agency Recommendations:

- The DNR should update the composition and reconvene the Stewardship Advisory Council to help inform a new strategic direction for the Stewardship Program.

Priority ISSUE

CHRONIC WASTING DISEASE



DNR Staff collecting tissue samples for CWD testing. Photo Credit: Wisconsin DNR

BACKGROUND

Deer hunting is a tradition enjoyed by over 800,000 hunters annually with over 7 million days of outdoor recreation and nearly \$1.4 billion in annual state economic impact. Chronic Wasting Disease (CWD) however threatens our iconic wildlife species and it threatens our entire deer hunting tradition.

The Association of Fish and Wildlife Agencies has called CWD the most important disease threatening North America's wild cervids.

Chronic Wasting Disease is a contagious and always fatal neurological disease affecting deer, moose and elk. It is caused by transmission of malformed proteins called "prions" that damage the brains of infected animals leading to emaciation, abnormal behavior, loss of bodily functions and death. Prions spread from animal to animal, are extraordinarily persistent in the environment and resist most common methods of decontamination. Research shows that as healthy deer have more frequent contacts with infected deer or environments, CWD prevalence increases. Samuel and Storm (2016) found that adult male transmission rates were 3 to 4 times higher than adult female transmission rates and suggested that environmental transmission is not the driving force in CWD spread in the Midwest.

Prions may persist in the soil where infected animals have died, and research from the National Wildlife Health Center demonstrates that prions can be taken up in the foliage of plants, including crops such as corn, which may create pathways to uptake by livestock or humans (Johnson, 2013).

Although medical research has not yet shown direct evidence of CWD transmission to humans, medical professionals remain concerned about that possibility. The World Health Organization, Centers for Disease Control and Prevention, and Wisconsin's Department of Health all recommend that hunters avoid consuming harvested deer that test positive for CWD.

In February 2019, Dr. Michael Osterholm, Director of the University of Minnesota's Center for Infectious Disease Research and Policy told Minnesota lawmakers "It is my best professional judgement ... that it is probable that human cases of CWD associated with the consumption of contaminated meat will be documented in the years ahead."

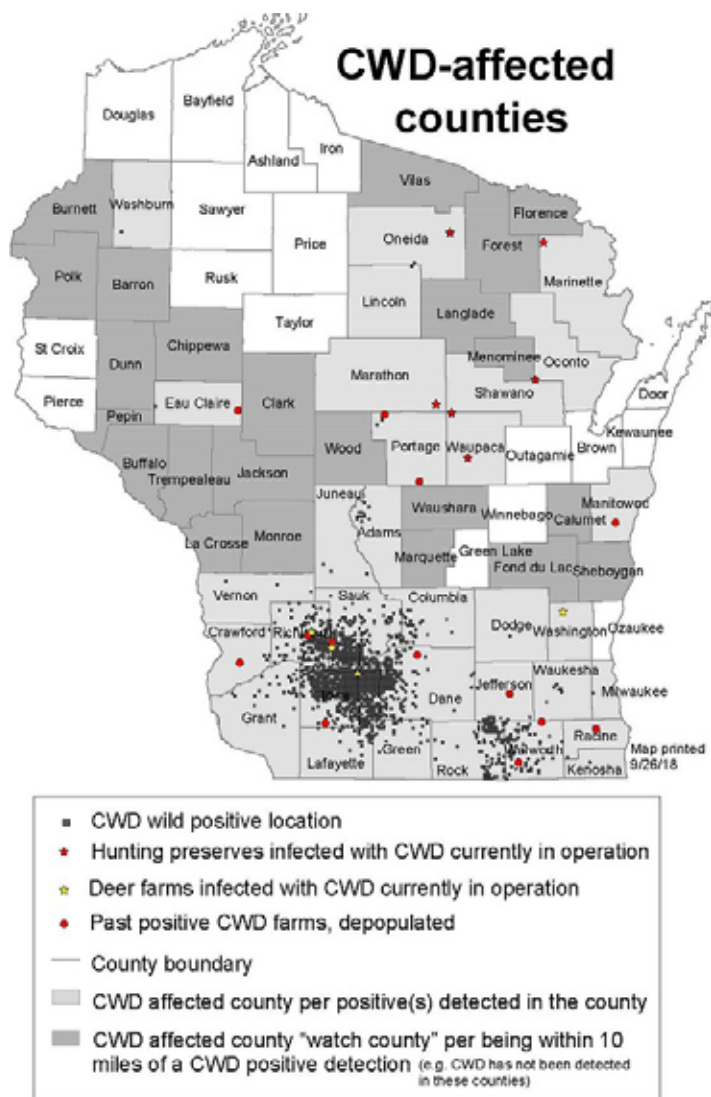
Since it was first detected in Iowa County in 2001, Chronic Wasting Disease has been detected in wild deer in 25 counties. Since 2002 nearly 227,000 deer have been tested in Wisconsin for CWD, with over 5,900 animals testing positive as of February 2019.

Currently 55 counties are considered "CWD Affected", which means they are within at least 10 miles of a wild or captive deer CWD-positive detection.

*See Map next page.

AGENCY ACTIVITIES

Management authority for CWD lies between the DNR, which has authority to manage wild deer, and DATCP, which has oversight authority to manage captive deer in deer breeding farms as well as in private contained hunting preserves.



Map provided by Wisconsin DNR

An independent expert, Dr. James Kroll of Texas, was hired by The Wisconsin Department of Administration in 2011 as Wisconsin's Deer Trustee to provide an independent evaluation of Wisconsin's deer management program. Dr. Kroll recommended in his 2012 [Deer Trustee Report](#) that: "We believe it is time to consider a more passive approach to CWD in the DMZ (Disease Management Zone)."

Since release of the Deer Trustee report, testing and monitoring have become DNR's primary management activities related to CWD and efforts to stop the rising CWD incidence and spread, or to aggressively control new satellite outbreaks have been scaled back.

DATCP, which regulates the captive deer farm industry, has likewise not fully used its authority to aggressively limit spread of CWD when detected in captive deer herds. In 2018, recognizing growing pressure to take more action, Governor Walker ordered the DNR to develop emergency

rules to limit the spread of CWD by restricting movement of deer carcasses from CWD affected counties, and by requiring deer farms to install double fencing in captive deer farms. The Joint Committee on Administrative Rules however subsequently suspended the portions of the emergency rule limiting carcass movement from CWD affected counties, but permitted enhanced fencing requirements to remain in place.

Currently, management of CWD in wild deer is guided by DNR's **Wisconsin's Chronic Wasting Disease Response Plan 2010-2025**. Its goal is to minimize the area of Wisconsin where CWD occurs and the number of infected deer in the state.

Unfortunately, CWD has spread and intensified significantly since the initial approval of the plan in 2010. DNR's ability to carry out disease management strategies in the plan is severely constrained by lack of funds and legislative limits on containment actions.

Four areas of need related to CWD response for the wild deer herd are:

- CWD surveillance programs track CWD distribution and prevalence but are inadequate to address hunter needs. Despite DNR's increased testing efforts in 2017-18, only 20-25% of deer in heavily infected areas were tested.
- Deer carcass disposal options are inadequate leaving hunters with few options. A statewide robust disposal system is needed.
- Increased CWD prevalence and spread within the wild deer herd isn't being addressed. The Association of Fish and Wildlife Agencies recommends using hunting to target portions of the deer herd with highest prevalence (males), as well as CWD hotspots.
- Current research capacity is inadequate to meet Wisconsin's needs.

ADMINISTRATIVE DIRECTION

Wisconsin's Chronic Wasting Disease Response Plan 2010-2025 establishes goals for CWD management within the DNR's authority. DATCP has no similar guidance. The first 5-year review of the Response Plan was completed in February 2017 and the next review is scheduled to begin after the 2020 deer seasons. DNR biennial funding requests have not addressed the shortfalls identified by the 5-year review.

The DNR does not report performance measures related to CWD management in Wisconsin government's **Enterprise Dashboard** and **Biennial Budget**.

STAFFING AND BUDGET

DNR wildlife staffing has decreased by 10% (16 FTE) over the last 6 years, making it difficult to respond to increasing CWD management workloads.

The budget for CWD management within DNR has primarily been supported by state hunting license revenues and funds from federal taxes on hunting equipment. \$4 million was budgeted for CWD in 2002. That rose to \$32.3 million in the 2005-06 budget. Federal legislation has been proposed to provide financial assistance to states dealing with CWD. Funding for successful CWD management can't be sustained solely from hunting license fees. New sources of funding are required.

While the DNR increased funding for CWD testing in 2018, testing still relies extensively on private partners to build and service CWD testing kiosks for hunters. The single facility used by DNR staff to process deer heads for testing, which is in Black Earth, is a leased facility currently listed for sale.

CONCLUSION

Based on 16 years of history of CWD in Wisconsin, it is clear that without increased intervention CWD will spread throughout the state and infection rates will increase wherever it is found. Lack of disease management will, over the long term, reduce deer populations. Wisconsin's deer hunting heritage and its annual billion-dollar economic impact, as well as related jobs and property values are all at risk.

Completely eliminating CWD is not a realistic goal under current conditions unless or until scientific advances provide new tools to control the disease. However, it is critically important that we address this challenge head on using science-based management. *There is national consensus among wildlife agencies on Best Management Practices for prevention, surveillance, and management of CWD, however Wisconsin has not adopted many of these practices.*

The threat posed to the entire state by CWD warrants a stronger commitment to science-based management approaches to limit the spread, including reducing deer populations where necessary.

State agencies including DNR and DATCP must carry out their responsibilities in a coordinated way and collaborate at the field and leadership levels to limit the spread and reduce CWD incidence using the best tools available. State agencies should also collaborate with other states, and national and international counterparts to advance priority research.



Photo by Dolly Ledin

RECOMMENDED ACTIONS 2019-2021

Policy Recommendations

- **Baiting and feeding bans.** Deer baiting and feeding concentrates animals and increases disease transmission. Currently deer baiting and feeding is banned in 55 CWD affected counties. A statewide ban would clarify the current patchwork of rules and would likely reduce the risk of further spreading CWD.
- **Harvest flexibility and incentives.** DNR, working together with County Deer Advisory Councils, should have flexibility to use hunting as a tool, including Earn-A-Buck, to reduce CWD prevalence and spread. Incentive programs like Payment for Positives that maximize landowner and hunter participation in CWD management should be explored.
- **Governor's Council on CWD.** The Governor should appoint a CWD Council that would help ensure that Wisconsin's disease response is guided by the best available science and monitor state agency performance to ensure timely, cooperative and coordinated action.

Budget Recommendations:

- **CWD Testing.** Increase funding and capacity to significantly increase access to CWD testing by hunters in each county. Better testing methods with a faster result delivery are needed.
- **Increase permanent staffing for CWD program.** Authorize new FTE positions for DNR CWD operations.
- **Permanent Sample Facility.** Allocate funds to acquire a permanent CWD sample processing facility near the area where CWD prevalence is highest.
- **CWD Research Partnership** - Provide \$2 million annually to be leveraged with funding from other midwestern states, universities and federal agencies to advance high-priority research on CWD control, develop faster testing methods, study carcass disposal, herd genetics, assess risks of agricultural crop contamination, and risks to human health.
- **Funding Sources.** Hunting license revenues are inadequate to sustain existing wildlife conservation programs and fund increased CWD management. New sources of stable funding from both state and federal sources are needed.

Agency Recommendations:

- **Depopulate and secure CWD positive deer farms.** Wisconsin currently has 7 CWD-positive captive deer herds whose continued operation poses an infection risk to surrounding wild herds. DATCP should use its existing authority to depopulate these herds and ensure that these facilities do not pose a future infection risk to the wild deer herd.
- **Timely and transparent reporting.** DNR and DATCP should collaborate to make sure Wisconsin's citizens have access to CWD testing results for both wild and captive deer on a searchable web-based platform with up-to-date testing results by county.

Priority ISSUE

CLIMATE CHANGE



Highway 13 in Ashland County July 2016. Photo by Nancy Larson

BACKGROUND

This assessment focuses primarily on risk management and educational activities within the mission of the Department of Natural Resources.

Most Wisconsin residents will not need climate reports to be well-aware of the pattern of intense storms and precipitation events that have characterized our summers, especially in the last ten years. This pattern of damaging storms is one of the most visible signs that our climate is changing.

The impacts of climate change however extend well beyond flood events and will increasingly alter life for Wisconsin residents and affect the prosperity of our communities.

Appropriate response to climate change will involve a broad set of strategies with widely variable time frames and benefits.

[Wisconsin's Changing Climate](#), produced by the Wisconsin Initiative on Climate Change Impacts (WICCI) in 2011, includes assessments of the wide range of expected and observed climate change related impacts including those to water resources, forests, wetlands and natural habitats, agriculture and forestry, coastal resources, and expected and possible impacts on human health.

The WICCI report also documents a wealth of historic temperature and precipitation data for Wisconsin, and summarized 14 different analyses of global air and water circulation patterns, which concludes that Wisconsin's climate has gotten and will continue to get wetter and warmer.

[Fourth National Climate Assessment](#), Volume II, (2018), prepared by the U.S. Global Change Research Program, provides exhaustive and more current conclusions about climate change impacts. The report's Midwest Chapter concluded that the Midwestern United States will experience not only warmer temperatures but "more extreme precipitation events that will affect infrastructure, public health, agriculture, forestry, transportation, air and water quality and more."

A partial list of declared disasters in Wisconsin (all resulting from precipitation and storm related events) prepared by [Wisconsin Emergency Management](#) documents the rising costs of the most severe flood and weather related events. Since 2007, just a few of the notable and most costly climate related events that involved federal disaster declarations have included:

- In June 2008 severe floods over several days in southern Wisconsin broke numerous previous precipitation and river flood level records and included a federal declaration for 31 counties. The disaster was deemed an "incident of national significance".
- In July 2016 severe thunderstorms produced 8-12 inches of rain in northwest Wisconsin in a 24-hour period, severing major highways and resulting in four deaths. A federal disaster declaration covered 8 counties as well as the Bad River Band of Lake Superior Chippewa.
- In August - September 2018 floods in southern Wisconsin led to a federal disaster declaration for 14 southern Wisconsin Counties. While the full costs of this event are still being finalized, Dane County alone estimated total flood related damages at over \$154 million.

[The State of Wisconsin Hazard Mitigation Plan](#) (Wisconsin Emergency Management, 2016) summarizes state and federal disaster declarations in the last 25 years.

Of the \$105.8 million in federal disaster aid awarded in Wisconsin between 1991-2016, 22% was awarded in the 15 years prior to 2007, and 68% was awarded in the 10 years between 2007 and 2016.

The extensive damages from the 2018 flood disasters in southern and northern Wisconsin are not included in this total.

As the hazard Mitigation Plan summary states, "The unprecedented frequency and severity of natural disasters established in the last decade has continued into the present one."

The **Fourth National Climate Assessment** provides a reasonably complete picture of both national and regional predications for climate change impacts.

[Chapter 21: The Midwest](#) includes this summary:

Land conversion, and a wide range of other stressors, has already greatly reduced biodiversity in many of the region's prairies, wetlands, forests, and freshwater systems. Species are already responding to changes that have occurred over the last several decades, and rapid climate change over the next century is expected to cause or further amplify stress in many species and ecological systems in the Midwest. The loss of species and the degradation of ecosystems have the potential to reduce or eliminate essential ecological services such as flood control, water purification, and crop pollination, thus reducing the potential for society to successfully adapt to ongoing changes. However, understanding these relationships also highlights important climate adaptation strategies. For example, restoring systems like wetlands and forested floodplains and implementing agricultural best management strategies that increase vegetative cover (cover crops and riparian buffers) can help reduce flooding risks and protect water quality.

The impacts of climate change on natural resources, including our forestry and agriculture sectors, will be widespread and multi-faceted, and in some cases are already being experienced.

- Public officials at all levels need to properly assess and plan for climate risk to minimize risks to health and safety and especially to help protect vulnerable populations.
- Farmers and forest owners already assume significant risks in their investments in land, equipment, and market decisions. Climate change increases their risks and adds complexity to decision making, especially regarding long-term investments.
- Natural resource managers in all disciplines will need to make informed decisions about climate change impacts on air, land, water, and fish and wildlife, as well as their facilities and infrastructure that serve public properties.

Natural resources management can be a powerful tool for offsetting greenhouse gas emissions however, and the DNR is well positioned to support strategies around that effort. According to recently published research by The Nature Conservancy, conservation land management can provide up to 37 percent of the emission reduction needed by 2030 to keep global temperature increases under 2 degrees Celsius.

AGENCY ACTIVITIES

Nearly all of DNR's activities and responsibilities may involve or be affected to some degree by climate-change, from reducing air pollution or managing wetlands and floodplains, to restoring trout habitat or developing snowmobile trails. To carry out its assigned air, water, land, fish and wildlife management duties, DNR staff collect and analyze data on climate trends.

The DNR was a lead agency in the 2005 Governor's Task Force on Global Warming and DNR staff led the production of the group's final report in 2008. Beginning in 2011, Governor Walker's administration reduced or eliminated most direct efforts to address Climate Change.

ADMINISTRATIVE DIRECTION

One of Wisconsin's premier efforts to address climate change was creation of an interagency Wisconsin Initiative for Climate Change Impacts (WICCI). The 2011 WICCI report provided a benchmark and direction for DNR's work on Climate change, and the DNR was an active partner along with the University of Wisconsin

in leading the WICCI effort. Since 2011, DNR has scaled back its staff commitment and involvement with WICCI and currently the provides what appears to be a very limited degree of staff support to the effort. The only references to WICCI currently available on the department's website are primarily archived articles.

By disengaging from climate change work, Wisconsin has missed opportunities to reduce future natural resource impacts, increasing the risks of economic and environmental impacts. Public land management decisions today can still help limit global temperature increases.

The DNR's orientation toward climate change made news in 2016 when communications staff were ordered to remove climate-related information on its web pages and re-state the department's position on climate change, which previously included statements about the primarily human causes and predicted effects.

The introductory language added in 2016 to the department's web-page titled "The Great Lakes and a Changing World" stated:

"As it has done throughout the centuries, the earth is going through a change. The reasons for this change at this particular time in the earth's long history are being debated and researched by academic entities outside the Wisconsin Department of Natural Resources."

While not all climate information has been removed nor has staff participation in climate change related efforts been prohibited completely, statements and directives by DNR leadership have contributed to a period of limited action, not only by the department's own experts but also by partners and citizens.

Of the two core strategies for addressing climate change – adaptation (preparing for climate change impacts) and mitigation (reducing or offsetting greenhouse gas emissions), in particular there has been almost no emphasis to date within the department on mitigating climate change – one area where the DNR is especially well prepared to be influential.

STAFFING AND BUDGET

The DNR does not have staff positions dedicated to climate change, nor does it track staff hours spent on climate change efforts. DNR specifically eliminated staff effort to co-lead WICCI (one full-time limited term position and one-half time of DNR's economist position). Published results of a 2014 survey of DNR wildlife staff provides a gauge for the amount



The range of snowshoe hare in Wisconsin has receded north over the past 40 years - the shorter duration of snow cover in central and southern Wisconsin is related to this change in distribution.



During the 2008 flood events in Sauk County a shoreline of Lake Delton collapsed, draining the lake into the Wisconsin River, destroying homes, and severing a county highway. Photo by Madison Newspapers.

of time spent on climate work: Although only 29% of the respondents were or had been involved in climate change work, 77% said they would get involved without additional incentives or direction at work.

DNR professional staff are generally well-versed in climate science, especially as it affects their individual disciplines. There is substantial capacity within the agency to restore its role as a lead agency on climate issues.

Our analysis indicates that DNR did not have budget items specifically allocated to climate change over the past 4 years. Currently there are no enterprise or budget performance measures for DNR that relate to climate change and no specific outcome of DNR climate change work has been reported over the past 2-4 years.

CONCLUSION

Appropriate response to climate change will involve a broad set of strategies with widely variable time frames and benefits. The state of knowledge in climate science will never be perfect, but it is significantly higher than it was just five years ago.

Based on scientific findings about the extent, cause and impacts of climate change, we need to fully acknowledge the causes and risk of climate change, and start now to actively mitigate greenhouse gas emissions and adapt to likely future climate conditions. A 2008 report to Governor Doyle, [Wisconsin's Strategy for Reducing Global Warming](#), contains an expansive summary of recommendations for reducing and mitigating greenhouse gas emissions, and for adapting to future climate change impacts. Although the report is now 10 years old, it remains a useful reference for policy makers.

It is increasingly clear that preparing for climate change impacts needs to involve risk assessment, planning, and targeted investments to protect public safety and infrastructure.

The State of Wisconsin Hazard Mitigation Plan 2016

(Wisconsin Emergency Management) is a well-developed effort that integrates all hazards assessment and preparedness across state and federal agencies. Climate change is clearly and appropriately referenced in this plan. Since many of the risks assessed are climate related, the Hazard Mitigation Plan is a logical vehicle for assessing and planning for climate related risks statewide.

RECOMMENDED ACTIONS 2019-2021

Policy Recommendations

- We recommend that the Governor direct all state agencies, **especially DNR, DATCP, the Department of Health Services (DHS), and the Division of Emergency Management** as lead agencies to coordinate government-wide participation in climate-related risk reduction. An update to the **2016 Wisconsin Hazard Mitigation Plan** would be an appropriate vehicle for that planning.
- In 2019, the agencies identified should assess progress on adaptation directions in Wisconsin's Changing Climate report (WICCI, 2011).
- Wisconsin should join and participate actively in the U.S. Climate Alliance. The participation of neighboring states of Illinois, Michigan, and Minnesota in the Climate Alliance will create opportunities for national and regional initiatives that can facilitate effective climate action.
- Local units of government should be incentivized to integrate planning to assess and mitigate climate change impacts within their land use planning efforts. Wisconsin's Comprehensive Planning Law can provide guidance for climate risk updates to comprehensive land use plans.

Budget Recommendations:

- Provide funding through the Department of Administration's Comprehensive Planning Grant Program to create cost-sharing for local units of government to update their land use plans to reflect climate risk assessment and mitigation.
- Add staffing within the DNR to manage a climate risk assessment and adaptation program. Core functions would be to support climate risk assessment on state lands and DNR facilities, and training and support for local government outreach and climate risk planning.
- DNR, and all state agencies, where feasible, should invest in the use and demonstration of renewable energy projects to support fleet and facilities.

Agency Recommendations:

- Climate change work should be an acknowledged priority for DNR administrators, managers, and staff.
- Encourage and facilitate DNR programs to work with their federal, state, municipal, academic and private partners to collect and analyze essential data such as streamflow, lake levels, climate-related air pollutants, and climate-affected species (e.g., toxin producing algae).
- Restore and update content on a broad range of climate related information through the DNR website and other educational mechanisms within DNR programs and activities.
- The DNR should resume full participation in the Wisconsin Climate Change Initiative and provide staff support in appropriate disciplines as well as leadership for the WICCI effort.
- DNR should undertake a risk assessment for department facilities and lands to assess threats from climate change and identify needed investments and strategies to address those threats.

REFERENCES

Italicized titles below are the titles used to identify the source of information cited in the report. References are in alphabetical order by title; not in order of appearance in the report. Web links to documents are provided (if available) in the **title**.

Biennial Budget, Wisconsin Department of Administration (DOA) 2019-21 Biennial Budget Agency Requests, Natural Resources Department and Environmental Improvement Program. 2018 <https://doa.wi.gov/budget/SBO/2019-21%20370%20DNR%20Budget%20Request.pdf>

Bradbury, et al., 2017 ***A groundwater flow model for the Little Plover river basin in Wisconsin's central sands***. WGNHS Bulletin 111.

Carlo, et.al. ***Chronic wasting disease: Status, Science and Management***, National Wildlife Health Center, 2018. <https://pubs.er.usgs.gov/publication/ofr20171138>

Deer Trustee Report, Kroll, James. Wisconsin Department of Administration (DOA) 2012. <https://dnr.wi.gov/topic/wildlifehabitat/trustee.html>

Drinking Water Report. Wisconsin's Public Water Systems 2017 Drinking Water Report, Wisconsin Department of Natural Resources Bureau of Drinking Water and Groundwater. Document # DG0045. 2018. <https://dnr.wi.gov/files/PDF/pubs/DG/DG0045.pdf>

Enterprise Dashboard, Wisconsin Department of Administration (DOA). <https://performance.wi.gov/DNR.html>

Food Land and Water: Can Wisconsin Find Its Way? Matson, James. Wisconsin Land and Water. 2016. https://wisconsinlandwater.org/files/events/02_FLW_Exec_Summary.pdf

Fourth National Climate Assessment Volume II: Impacts, Risks and Adaptation in the United States. U.S. Global Change Research Program, 2018. <https://nca2018.globalchange.gov/>

Griscom, et.al.,. ***Natural Climate Solutions*** Proceedings of the National Academy of Sciences. 2017. The Nature Conservancy.

Groundwater Coordinating Council ***Annual Report to the Legislature, 2018***. <https://dnr.wi.gov/topic/groundwater/documents/GCC/Report/FullReport2018.pdf>

Groundwater pumping effects on groundwater levels, lake levels and stream flows in the Wisconsin Central Sands. Report of Project NM100000247. Center for Watershed Education and Science, University of Wisconsin – Stevens Point. 2010.

Irrigation effects in the northern Lake States – Wisconsin Central Sands revisited. Kraft, et al. Ground Water Journal 50:308-318. 2012.

Johnson, C. 2013. **Uptake of Prions into Plants.** U.S. Geological Survey, National Wildlife Health Service.

Land Legacy Report. Wisconsin Department of Natural Resources, 2006.
<https://dnr.wi.gov/files/PDF/pubs/lf/LF0040ch2.pdf>

Northern Wilds Magazine. Osterholm sees human health risk in CWD. December, 2018.
<http://northernwilds.com/osterholm-sees-human-health-risk-in-cwd/>

Outdoor Industry Association. **Wisconsin Outdoor Recreation Economy Report, 2017.**
<https://outdoorindustry.org/resource/wisconsin-outdoor-recreation-economy-report/>

Samuel, Michael D. and Daniel J. Storm. 2016. **Chronic wasting disease in white-tailed deer: infection, mortality, and implications for heterogeneous transmission.** Ecology, 97(11), pp. 3195–3205.

Southwest Wisconsin Groundwater and Geology Study. Wisconsin Geologic and Natural History Survey, 2018. <https://iowa.extension.wisc.edu/community-development/swigg/>

Statewide Comprehensive Outdoor Recreation Plan (SCORP). Wisconsin Department of Natural Resources. Draft, 2018. <https://dnr.wi.gov/topic/Lands/scorp/>

Stewardship Overview 2019-2021. Wisconsin Department of Natural Resources. 2018.

Summary of Monitoring and Assessments Related to Environmental Flows in USGS Water Science Centers Across the US. US Geological Survey. 2013.

Weeks, et al., **Hydrology of the Little Plover River Basin Portage County Wisconsin and the effects of water resource development.** Geological Survey Water Supply Paper 1811. US Government Printing Office, Washington DC. 1965.

Weeks, et al., **Effects of irrigation on streamflow in the Central Sand Plains of Wisconsin.** US Geological Survey Open-File Report. 1971.

Wisconsin's Changing Climate: Impacts and Adaptation. Wisconsin Initiative on Climate Change Impacts. Nelson Institute for Environmental Studies, University of Wisconsin-Madison and the Wisconsin Department of Natural Resources, Madison, Wisconsin. 2011. <https://www.wicci.wisc.edu/publications.php>

REFERENCES (continued)

Wisconsin Conservation Survey. Public Opinion Strategies. 2015.
Wisconsin Geologic and Natural History Survey.

Assessing Private Well Contamination in Grant, Iowa, and Lafayette Counties, Wisconsin, 2018. <https://iowa.extension.wisc.edu/community-development/swigg/>

Wisconsin Hazard Mitigation Plan, 2016, Wisconsin Emergency Management, 2016.
<https://dma.wi.gov/DMA/wem/mitigation/2016-hazard-mitigation-plan>

Wisconsin Legislative Audit Bureau **Wastewater Permitting and Enforcement** Report 16-6, June 2016. <http://legis.wisconsin.gov/lab/reports/16-6full.pdf>

Wisconsin Legislative Fiscal Bureau **Nonpoint Source Water Pollution Abatement and Soil Conservation,** Informational Paper 69, 2019. https://docs.legis.wisconsin.gov/misc/lfb/informational_papers/january_2019/0069_nonpoint_source_water_pollution_abatement_and_soil_conservation_programs_informational_paper_69.pdf

Wisconsin Legislative Fiscal Bureau **Warren Knowles-Gaylord Nelson Stewardship Program,** Informational Paper 61, 2019. http://docs.legis.wisconsin.gov/misc/lfb/informational_papers/january_2017/0061_warren_knowles_gaylord_nelson_stewardship_program_informational_paper_61.pdf

Wisconsin Managed Lands Needs Assessment. Wisconsin Department of Natural Resources. 2010.

Wisconsin's Strategy for Reducing Global Warming, Governor's Task Force on Global Warming, 2008. <https://www.adaptationclearinghouse.org/resources/wisconsin-s-strategy-for-reducing-global-warming.html>

Wisconsin Well Water Quality Viewer. Accessed Feb. 2019. University of Wisconsin-Stevens Point Center for Watershed Science and Education. <https://www.uwsp.edu/cnr-ap/watershed/Pages/WellWaterViewer.aspx>

Wisconsin's 2018 Water Quality Report to Congress. Wisconsin Department of Natural Resources, Division of Environmental Management, 2018. https://dnr.wi.gov/topic/impairedwaters/2018ir_iwlist.html

WGF Analysis. Comment letter submitted to the Natural Resources Board by Paul Laliberte. <https://wigreenfire.files.wordpress.com/2018/12/wgf-comments-nrb-cafo-2018-10-15.pdf>

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OPPORTUNITIES NOW 2019-2021

An Analysis of Priority Issues and Actions for Wisconsin's Natural Resources

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Our Mission

Wisconsin's Green Fire supports the conservation legacy of Wisconsin by promoting science-based management of our natural resources.

WGF members include career natural resource professionals and scientists from a variety of disciplines throughout Wisconsin.

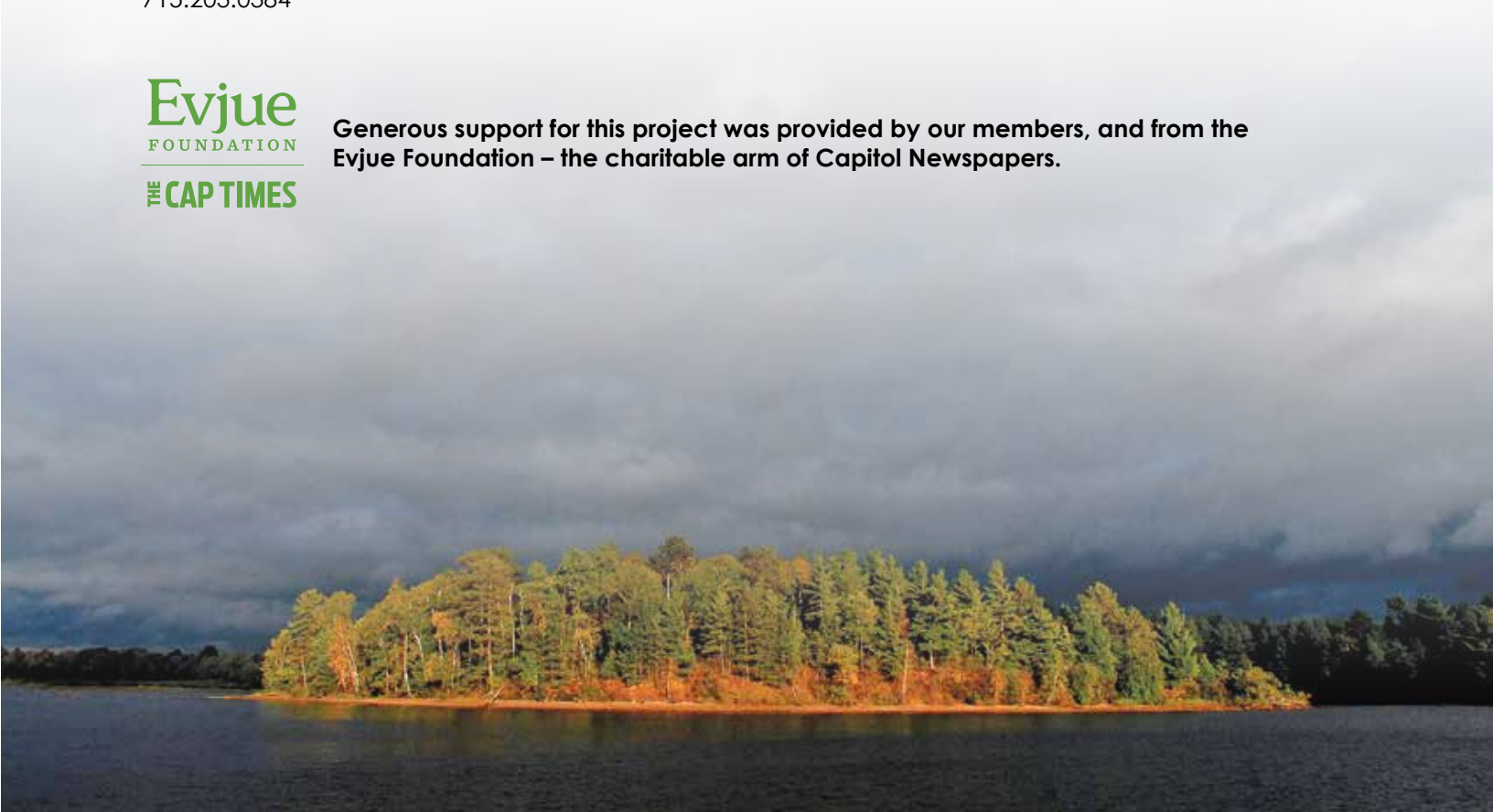
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