

# IOWA NONPOINT SOURCE MANAGEMENT PLAN



# ACKNOWLEDGMENTS/CONTRIBUTIONS

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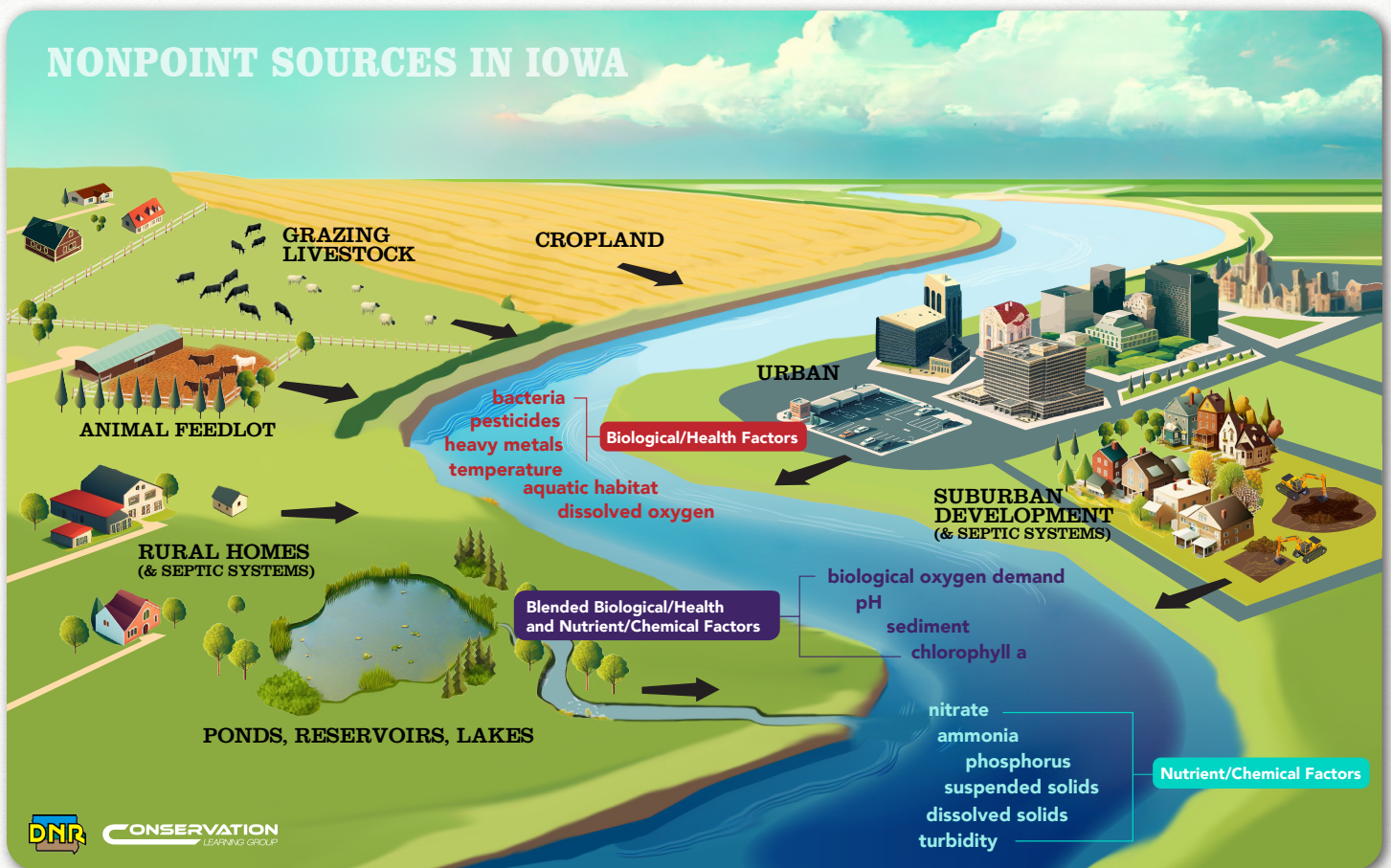
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# SECTION 1: INTRODUCTION TO MANAGING IOWA'S NONPOINT SOURCE POLLUTION

## 1.1 PURPOSE AND HISTORY

Iowa's Nonpoint Source Management Program Plan (NPSMP, or Plan) articulates the state's approach to addressing nonpoint source (NPS) pollution in Iowa's surface and groundwater. Since most pollution in Iowa's waterways comes from nonpoint sources, it is imperative that the state has a robust plan to address NPS pollution.

NPS pollution—unlike pollution from industrial and sewage treatment plants—comes from many dispersed sources. According to the U.S. Environmental Protection Agency (EPA), "NPS pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification."<sup>1</sup> It occurs when rainfall or snowmelt picks up pollutants as it moves over and through the ground, and deposits them in surface and ground waters.



<sup>1</sup> Basic Information About NPS Pollution, United States Environmental Protection Agency, <https://www.epa.gov/nps/basic-information-about-nonpoint-source-nps-pollution>

Nonpoint sources of pollution include, but are not limited to—

- Fertilizers, herbicides, and pesticides from agricultural and residential land management.
- Oil and grease from urban runoff.
- Sediment from croplands, eroding streambanks, and construction sites.
- Bacteria and nutrients from livestock and faulty septic systems.<sup>2</sup>

Addressing this type of pollution is challenging, but provides an opportunity to implement land-use practices that provide multiple benefits—reducing pollution while also providing habitat for wildlife, enhancing recreational opportunities across the state, and mitigating flood and drought conditions.

Section 319 of the Clean Water Act (CWA) provides grants to states and tribes for projects that address NPS pollution. To be eligible for funding, states must develop a NPSMP that encompasses nine key elements, or key components, required by the EPA. EPA'S Nine Key Elements for State NPS Management, on the following page, summarizes the ways Iowa's NPSMP actively addresses each of these components.

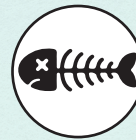
Iowa's NPSMP represents Iowa's vision, goals, objectives, and potential action steps to reduce NPS pollution and improve water quality. To remain eligible for Section 319 funding, the state must update the Plan every five years to incorporate lessons learned, changing circumstances, and new priorities and opportunities. Iowa's original NPSMP assessment dates back to 1990, with major Plan updates completed subsequently in 2000 and 2012,<sup>3</sup> and minor updates completed in between.

Heavy agricultural land use in the Upper Midwest makes it particularly important that Iowa and neighboring states address and mitigate NPS pollution. One of the most significant areas of progress in NPS management since 2012 has been the adoption of nutrient reduction strategies to curb nutrient pollution in the Upper Mississippi River Basin. Nutrient pollution is largely the result of fertilizer from agricultural operations; legacy nutrients lost due to cropping system management strategies; soil erosion; and, to a lesser extent, fertilizer from residential uses.

Iowa adopted its Nutrient Reduction Strategy (NRS) in 2013.<sup>4</sup> The NRS nonpoint source program is a non-regulatory program that offers incentives for voluntary adoption of Best Management Practices (BMPs) across the Iowa landscape, striving to reduce nonpoint nitrogen and phosphorus pollution. The state tracks and periodically reports its progress toward achieving its nutrient reduction goals, and continues to invest in its NRS through financial incentives and farmer outreach.

## WHY IS NUTRIENT POLLUTION A CONCERN?

Excess nitrogen and phosphorus can—



Cause algae blooms, contributing to low dissolved oxygen and fish kills.



Disrupt ecosystems.



Threaten drinking water sources.

<sup>2</sup> Id.

<sup>3</sup> Iowa Nonpoint Source Management Plan, 2012 edition, [https://www.iowadnr.gov/Portals/idnr/uploads/water/watershed/files/npsmp\\_main.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/water/watershed/files/npsmp_main.pdf)

<sup>4</sup> Iowa Nutrient Reduction Strategy, <https://www.nutrientstrategy.iastate.edu/documents>

## EPA'S Nine Key Elements for State NPS Management

Key Element	Addressed in Iowa NPSMP?	Location in Iowa NPSMP
1. Provide explicit short- and long-term goals and strategies.	✓	Section 2 Section 3 Section 4 Section 5 Section 6
2. Provide strong collaborative partnerships among state, federal, local, tribal, and private-sector stakeholders.	✓	Section 1.3
3. Provide a balanced approach that emphasizes both statewide and watershed efforts.	✓	Section 1
4. Abate known water quality impairments and prevent pollution of unimpaired waters.	✓	Section 2 Section 3 Section 4 Section 5 Section 6
5. Identify impaired and threatened waters and establish a process to progressively address these.	✓	Section 1.2 Section 2
6. Address all components required by Section 319 of the Clean Water Act and expeditiously restore and protect water resources	✓	Section 1 Section 2 Section 3 Section 4 Section 5 Section 6 Section 7
7. Identify federal lands and activities that are not managed consistently with state nonpoint source program objectives.	✓	Very few federal lands in Iowa.
8. Provide efficient and effective management and implementation of state nonpoint source management program, including financial management.	✓	Section 1.2
9. Review, evaluate and update nonpoint source assessment and management program at least every five years.	✓	2023 Iowa Nonpoint Source Management Plan (complete document)

Over the past decades, the state has learned several key lessons about successful approaches to addressing NPS pollution:

- Sustained long-term investment is necessary for success. Resources, including sustained funding and dedicated long-term watershed coordinators, are vital to successful watershed projects.
- Water quality work takes time. A full project timeline—project planning, choosing and designing a suite of practices, implementing the practices, and monitoring to assess practice performance—may take 15 to 20 years.
- Local buy-in is crucial. Watershed coordinators and other local personnel are well situated to form connections with community leaders, developing trust and buy-in on projects to reduce NPS pollution.
- Statewide outreach and education are essential. Outreach and education for all Iowans—from all backgrounds and walks of life—are key to building and sustaining momentum for improved water quality. Farmer and landowner outreach is more effective when multigenerational community outreach is also a piece of the patchwork, reaching the various interwoven threads that make up farmers’ social networks, including youth and non-farming members of the local community.

**Moving forward, implementing Iowa’s NPSMP will focus on four action categories:**

- **Outreach and education**
- **Planning**
- **Practice implementation**
- **Measurements and monitoring**

## 319 PROGRAM SUCCESS STORIES



### IOWA GREAT LAKES

*Tourism thrives, wetlands and native prairie segments return*



Section 319 grants have funded multiple projects to improve and protect lakes in Dickinson County, particularly West Lake Okoboji. These lakes drive a thriving tourism industry in northwest Iowa, and the local economy depends on good water quality for swimming, boating, and other recreation activities.

The Iowa Great Lakes Watershed Project has restored wetlands and returned native prairie segments across the watershed. These restorations provide multiple benefits—filtering pollutants, reducing sediment entering the lakes, and increasing habitat for native fish, bird, and plant species.

## LAKE RESTORATION IN NORTH CENTRAL IOWA

*Shallow lake ecosystem thrives following carp removal*



Located in Wright County, Big Wall Lake is a 978-acre shallow glacial lake. Common carp, a nuisance fish species, entered Big Wall Lake during high water events in 1993. The bottom-feeding fish uprooted and eliminated the lake's beneficial submerged aquatic vegetation and continuously stirred up bottom sediment. The resulting increased turbidity blocked light from reaching the lake bed, preventing the growth of healthy aquatic plants.

Section 319 grants supported installation of a new outlet structure to draw down the lake's water level and subsequent treatment of the lake with rotenone to eliminate the carp population. Following carp removal, desirable submersed and emergent aquatic vegetation reestablished, accompanied by decreased turbidity and improved water quality. The restorations also increased habitat and recreational value at Big Wall Lake, attracting huge populations of waterfowl and shorebirds including ducks, geese, sandhill cranes, American bitterns, black terns, and yellowlegs.<sup>5</sup>



## BROOK TROUT IN NORTHEAST IOWA

*Healthier streams support populations of native brook trout*

Section 319 grants supported land improvement efforts in the Yellow River headwaters and Silver Creek watersheds in northeast Iowa (Winneshiek and Howard Counties). These efforts focused on stabilizing streambanks, restoring floodplains, implementing soil conservation practices, and reducing livestock manure running into streams fostering bacterial growth.

Following restoration efforts, multiple benefits were realized, including improved water quality as well as improved habitat, with the streams able to support native brook trout for the first time in over 50 years. These streams continue to support naturally reproducing populations of native brook trout such as the South Pine brook trout.<sup>6</sup>



<sup>5</sup> <https://www.iowadnr.gov/About-DNR/DNR-News-Releases/ArticleID/1522/Visitors-to-Big-Wall-Lake-enjoying-benefits-of-renovation-expansion>  
<sup>6</sup> <https://www.iowadnr.gov/About-DNR/DNR-News-Releases/ArticleID/4320/Iowas-native-brook-trout-thrive-in-northeast-Iowa-streams-thanks-to-restoration-efforts>



## 1.2 WATER QUALITY IN IOWA

Iowa has abundant streams, creeks, and rivers. Rivers define Iowa's unique shape, with the Big Sioux and Missouri Rivers forming the western border, while the Mississippi River shapes the eastern border. The state boasts several other large river basins, including the Des Moines (defining a portion of the state's border with Missouri), Cedar, and Iowa Rivers, all of which eventually drain into the Mississippi River. Lakes form the backbone of numerous Iowa communities, and together with ponds and wetlands, provide a variety of outdoor recreation opportunities for Iowans.

### Water Quality Standards

The DNR administers a set of programs to assess the state of water quality in Iowa. Through these programs, the DNR gathers information about waterway conditions, applies that information against a set of water quality standards, determines the sources of water quality problems, and works with local communities to implement practices to remedy those problems.<sup>7</sup>

The DNR and United States Geological Survey (USGS) monitor pollutants in Iowa's rivers, lakes, and streams. Other organizations—including the Iowa Institute of Hydraulic Research (IIHR)—Hydroscience and Engineering at the University of Iowa, as well as local governmental and non-governmental organizations—also collect monitoring data. The DNR's monitoring group maintains an assemblage of ambient streams and lakes—a defined set of water bodies monitored regularly and tested for the same potential pollutants. This data set establishes baseline information and produces long-term water quality trends. Additionally, this data set allows the state to determine if a water body fails to meet the standards associated with its designated use.

Water quality standards most relevant to NPS pollution include those for nitrate, bacteria, pH, dissolved oxygen, ammonia, algae, and turbidity. Some pollutants measure against numeric criteria, which means the results of a water quality analysis should yield a number that lies within an acceptable range of values. Other pollutants measure against narrative criteria, such as "aesthetically objectionable conditions." The presence of algae blooms, which lacks a numeric trigger but is easily observed with the naked eye, is one example of narrative criteria. Several numeric and narrative criteria exist to determine if a water body meets expectations.<sup>8</sup>

Section 303(d) of the CWA authorizes the EPA to work with states on impaired water issues, and requires the state to report the condition of its water bodies according to monitoring data and water quality standards. If a water body fails to meet expectations for a particular standard, it is included on the state's impaired waters, or 303(d), list.<sup>9</sup> Iowa's 2022 Impaired Waters List<sup>10</sup> includes 598 impaired rivers and streams (most commonly impacted by bacteria) and 120 lakes and reservoirs (most commonly impacted by high levels of turbidity, algae, pH, and bacteria—often linking back to a common pollutant, typically phosphorus). Once a water body lands on the impaired waters list, the DNR must develop a Total Maximum Daily Load (TMDL) document that quantifies the problem and sets a level of pollution reduction that is designed to remedy the water quality problem.

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<sup>7</sup> Comprehensive information about Iowa's water quality can be found in the state's Integrated Report, <https://programs.iowadnr.gov/adbnet/Assessments/Summary/2020>

<sup>8</sup> The nuances of water-body usage, antidegradation of high-quality streams, and explanations behind the full suite of substances that hold a specific water quality standard are beyond the scope of this document. For a full listing of water quality standards, please refer to the Iowa Administrative Code under the Environmental Protection Commission (567) in Chapter 61. <https://www.legis.iowa.gov/IowaLaw/AdminCode/adminLaw.aspx>

<sup>9</sup> The list does not provide a comprehensive view of all potential impairments, as the monitoring network resources cannot support sampling of all water bodies in the state or for all potential pollutants. For more information on the impaired waters list, please visit: <https://www.iowadnr.gov/environmental-protection/water-quality/water-monitoring/impaired-waters>

<sup>10</sup> Summary of Iowa's 2022 Impaired Waters List, <https://programs.iowadnr.gov/adbnet/Assessments/Summary/2022>

The TMDL contains valuable information to help local water quality improvement efforts by estimating the relative contribution of pollutant sources and providing alternatives to achieve reductions. The DNR develops an implementation plan in each TMDL that provides potential solutions, so local citizens can decide what works in their watershed.

Once the DNR prepares a TMDL and it gains EPA approval, improvement in water quality usually depends on local stakeholders making alterations to the landscape or to the way the land is managed. These Best Management Practices (BMPs) encompass any conservation practice that improves water quality. These practices usually provide multiple benefits, such as new or improved wildlife habitat, topsoil retention, and localized flood mitigation.

A watershed management plan identifies the desired and acceptable BMPs, establishes a timeline and cost estimates to address water quality issues, and facilitates funding through state and federal sources, including the Section 319 program.

Many of the required elements of a watershed management plan share common ground with the water quality improvement plans prepared by the DNR. The difference between the two lies in the more comprehensive and locally developed nature of the watershed management plan, which also includes timelines and cost estimates. The best plans are updated regularly and learn from successes and failures alike.

Once one or more BMPs are installed on the landscape, the DNR and local partners continue to monitor impacted waterways. Through monitoring, officials can determine whether and to what degree the chosen BMPs are reducing pollutants and improving water quality. This follow-up monitoring is essential for understanding the effectiveness of BMPs, ensuring that resources are allocated in an effective manner, and determining whether a waterway has improved enough to be removed from the impaired waters list. The information gathered through monitoring also informs updates to watershed management plans and allows the DNR to communicate successes and lessons learned to the EPA and the public.

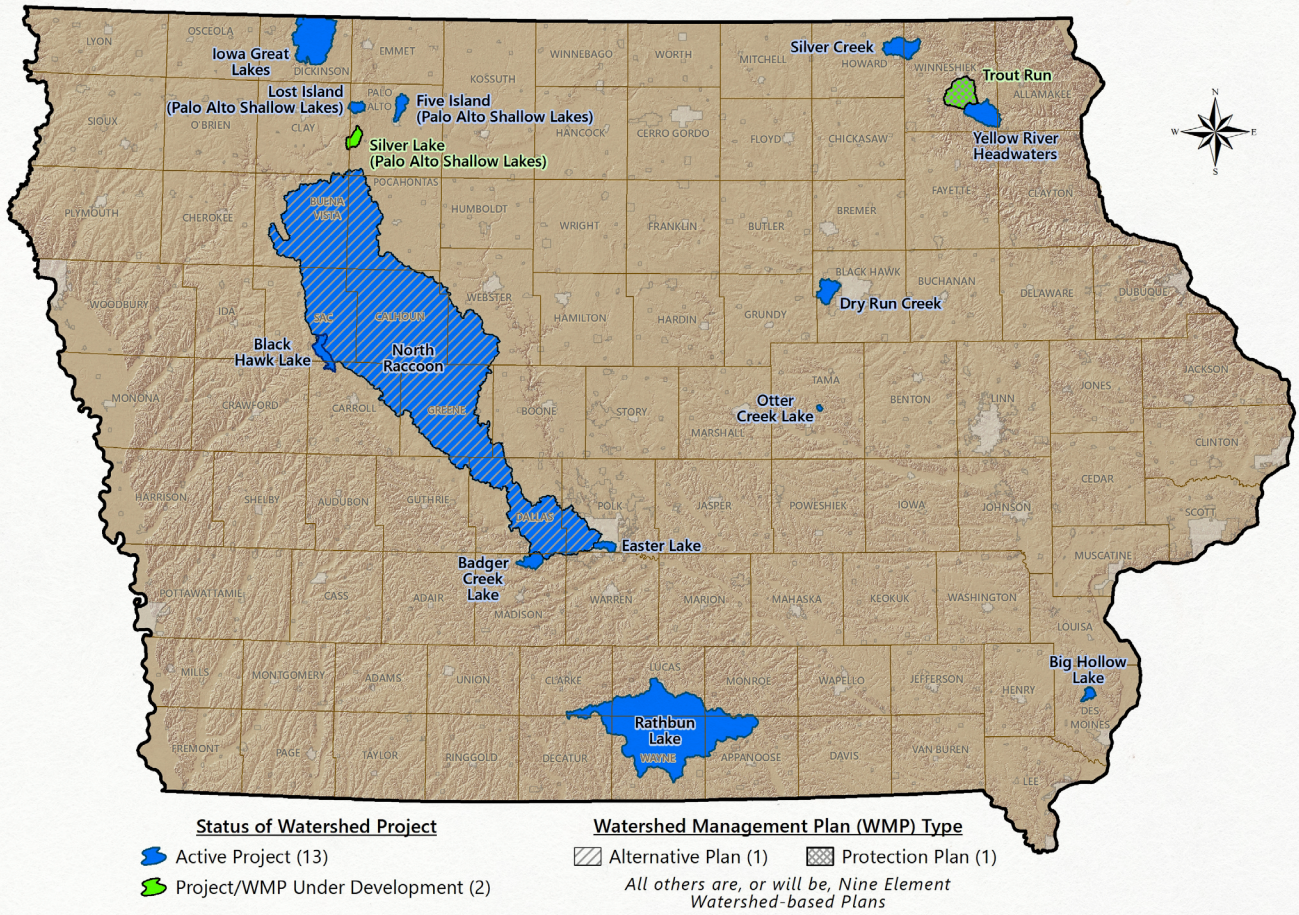
Many programs and funding sources throughout the state help implement projects that improve water quality related to nonpoint source pollution. The Section 319 program invests dollars to implement projects in watersheds where an identified water quality problem and an approved watershed management plan designed to achieve measurable water quality improvements exist. The Section 319 program usually limits its focus to smaller watersheds (less than 30,000 acres) where water quality improvements manifest in a reasonable timeframe. Iowa's Water Quality Initiative (WQI) supports qualifying nutrient reduction projects in alignment with the NRS. Iowa's Clean Water State Revolving Fund (SRF),<sup>11</sup> jointly administered by the DNR and the Iowa Finance Authority (IFA), is another key funding mechanism supporting nonpoint source pollution reduction and water quality improvement efforts in the state. The Iowa Department of Agriculture and Land Stewardship (IDALS) also implements several SRF nonpoint source programs.

**While nonpoint source pollution reduction measures may prove challenging, water quality improvements can be achieved through persistence, strategic partnerships, targeted resource allocation, and careful selection and placement of effective BMPs.**

Using public and private resources to achieve the objectives of the NPSMP is a vital component of progress and successful outcomes. Management of those resources is multifaceted and relies on strong partnerships working together to use funds efficiently and effectively. For instance, the DNR takes the lead role in the management of EPA CWA Sections 106, 604(b), and 319 grant funds to Iowa that contribute to monitoring, planning, and implementation efforts, respectively. IDALS and United States Department of Agriculture (USDA) partners provide significant contributions to the availability and management of state, local, and other federal leveraged funds. Additionally, the Environmental Protection Commission provides oversight of DNR contracting, with additional financial management assistance provided by interdepartmental collaboration with the Department of Administrative Services, Department of Management, and State Treasurer's and State Auditor's offices.

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<sup>11</sup> [https://www.iowasrf.com/program/nonpoint\\_source\\_water\\_quality\\_programs/](https://www.iowasrf.com/program/nonpoint_source_water_quality_programs/)



### 1.3 NPS POLLUTION MANAGEMENT FRAMEWORK



#### Reducing NPS Pollution

Partnerships are key to addressing NPS pollution, and responsibility for pollution mitigation requires cooperation and collaboration among various groups so that funds and resources are used efficiently and effectively. Numerous agencies and organizations across Iowa are involved in NPS pollution reduction efforts.

#### Iowa Department of Natural Resources

The DNR is the lead organization for many aspects of watershed planning and pollution reduction efforts. The DNR carries out state and federal laws that protect air, land, and water through technical assistance, permitting, and compliance programs. The DNR manages fish and wildlife programs, ensures the health of Iowa’s forests and prairies, provides recreational opportunities in Iowa’s state parks, and encourages the enjoyment and stewardship of natural resources among Iowans through outreach and education.

#### Iowa State University

Iowa State University (ISU) contributes to implementation of the Iowa NPSMP via the research and extension missions of the university. Faculty and staff conduct interdisciplinary research addressing nonpoint source pollution at the field, watershed, and system levels to improve understanding and develop solutions. Extension specialists communicate research-based information to increase knowledge of nonpoint source pollution and its impact on individuals and communities. Extension programs and individual consultations also create learning opportunities for farmers, landowners, and community members to understand and evaluate actions they can take to reduce nonpoint source pollution.

### ***Iowa Department of Agriculture and Land Stewardship***

IDALS offers programs and expertise across a wide spectrum of agricultural needs and issues, and works with Iowa's farmers as well as local farmers' markets to support the state's robust industry and culture around agriculture. The department is responsible for administering the nonpoint source portion of the state's NRS, working with farmers, landowners, and communities to provide resources for BMPs and other projects related to reducing nonpoint nitrogen and phosphorus pollution. State funding is available through the Iowa WQI for qualifying nutrient reduction projects.

IDALS partners with Iowa's 100 Soil and Water Conservation Districts (SWCDs) to implement conservation practices on private lands in Iowa, with SWCDs often providing office space for local watershed coordinators. Conservation Districts of Iowa (CDI), the professional association representing the state's SWCDs, also informs and educates Iowans through local SWCDs to promote conservation of natural resources.

### ***United States Department of Agriculture***

The USDA, through the Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS), administers many federal conservation programs in Iowa—including the Environmental Quality Incentives Program (EQIP), the Conservation Reserve Program (CRP), and the Conservation Reserve Enhancement Program (CREP). The USDA provides program technical assistance, funding, professional staffing, practice specifications, and engineering support and design for conservation practices. Additional support for watershed projects includes office space, training, vehicles, and information technology support for conservation planning and practice implementation.

### ***Iowa Flood Center***

The Iowa Flood Center at the University of Iowa serves as a supporting partner in NPS pollution reduction. The Center provides hydrogeological expertise and assists with the flood resiliency component of NPS runoff-based projects, including the Iowa Watershed Approach program. The Iowa Watershed Approach program, funded by the U.S. Department of Housing and Urban Development, works to address factors that contribute to floods. This approach is consistent with other statewide programs in Iowa to reduce flooding and improve water quality, such as the Iowa Flood Mitigation Program and the Iowa NRS.

### ***Watershed Management Authorities***

The Iowa legislature created Watershed Management Authorities (WMAs) as a mechanism for cities, counties, SWCDs, and stakeholders to cooperatively engage in watershed planning and management. The watershed-level collaboration between the organizations, governments, and people that make up a WMA allows these groups to take a comprehensive view of waterways across local jurisdictional boundaries. This is a benefit for many watershed planning and implementation efforts.

## Improving and Protecting Watersheds

In addition to NPS pollution reduction efforts, various organizations in Iowa focus on improving and protecting water quality through watershed planning and implementation.

### Water Quality Improvement Plans

The DNR prepares water quality improvement plans to implement TMDLs. These plans are specifically designed to restore impaired waterways. Water quality improvement plans identify and locate water quality problems in a stream or lake, and suggest ways for the community to improve the waterway to meet Iowa's water quality standards. The EPA and DNR provide resources for developing such plans, and the DNR also encourages community involvement in the watershed planning process.

### Source Water Protection

Protecting sources of drinking water is critically important for human health and safety. The term "source water" means drinking water in its original environment, either as surface water (rivers, streams, reservoirs, lakes) or as groundwater (aquifers), before it is withdrawn, treated, and distributed by a public water system. It is typically more efficient and less costly to prevent pollution from entering waterways than to remove pollutants from waterways downstream. The DNR administers a source water protection program to protect waters used by public water supplies. The DNR assesses drinking water sources for susceptibility to contamination, and assists public water systems and their local communities with developing and implementing source water protection plans.

### Other Community Plans

Other community-led plans, such as flood resilience and disaster management plans, also incorporate aspects of watershed planning. The Iowa Flood Center provides assistance on these types of plans.

The Iowa Soybean Association's Environmental Programs and Services team provides watershed planning assistance on nutrient pollution reduction. The team also assists with helping to secure funding for implementing various aspects of these plans.

## TYPES OF WATERSHED MANAGEMENT PLANS



### Watershed restoration plans

Designed to restore an impaired waterway and follow the nine elements of watershed planning (see chart in Section 3)



### Watershed protection plans

Designed to ensure that unimpaired waterways do not become impaired



### Comprehensive water quality management plans

Designed to address multiple water quality, quantity, and biological objectives, and funded through CWA Section 604(b) grants to Iowa

## **Education and Outreach**

Many organizations work to engage and educate Iowans across the state in understanding the importance of watersheds, water quality, and pollution reduction.

A cornerstone in NPSMP and NRS outreach and education is ISU Extension and Outreach. Its broad mission is to bring scientific research and non-formal education to all Iowans. While many ISU Extension and Outreach programs work on water quality issues, the Conservation Learning Group (CLG)—through its signature outreach programs, Iowa Learning Farms and Water Rocks!—lead this effort. Partnering with 100 county extension offices and SWCDs, the CLG team participates in hundreds of outreach and education events across the state each year. Iowa Learning Farms, begun in 2004, maintains a network of farmer partners across Iowa to serve as local contacts to area farmers and landowners. Water Rocks!, launched in 2012, is a statewide water-education program that fosters the interplay of knowledge, caring, and engagement among Iowa's youth. Through farmer field days, webinars, and classroom sessions—as well as its popular Conservation Station visits to county fairs and farmers' markets—the CLG engages all Iowans on issues relating to water quality in Iowa. In addition, the CLG has helped to develop educational tools such as the Whole Farm Conservation Best Practices Manual and the Private Well Stewardship Program, valuable components in NPSMP and NRS outreach.

## **Watershed Coordinator Training**

Another key element in improving watershed planning and implementation is training for watershed project coordinators and water quality specialists. Many organizations offer training for watershed coordinators and conservation professionals that lead local water quality improvement and conservation efforts, including:

- DNR Stream and Watershed Integration Management
- Iowa Water Conference Statewide Project Coordinator Meeting
- Regional Project Coordinator Meetings
- Soil and Water Conservation Society—Iowa Section Training Meetings
- Iowa Learning Farms webinar series
- Sand County Foundation Leadership for Midwestern Watersheds
- Iowa Prairie Network Iowa Prairie Conference
- Trout Unlimited Driftless Area Symposium
- ISU Extension and Outreach Land Stewardship Leadership Academy
- Confluence for Watershed Leaders Portal

## SECTION 2: NPSMP GOALS

Iowa's 2023 NPSMP focuses on four primary goals. The remainder of this document will explore each goal in greater detail. These goals are the result of lessons learned from previous and current nonpoint source pollution reduction efforts—including previous iterations of the NPSMP, collaboration among organizations working together to improve Iowa's water quality, and guidance from the EPA on priorities for nonpoint source pollution reduction at the national level (see Section 1.1 for lessons learned and 319 program success stories). Efforts to address these goals will draw from four major action categories—**outreach and education, planning, practice implementation, and measurements and monitoring.**

Iowa's NPSMP goals are:

### 1. Improving Iowa's Surface Water and Groundwater Quality

This goal encompasses restoring impaired surface waters, protecting waters (such as those identified as Outstanding Iowa Waters<sup>1</sup>), and addressing polluted groundwater. The state will work to develop and implement new projects according to various state and locally determined plans (e.g., TMDLs and watershed plans—see Section 1.3 for a list of plan types). This will ensure that resources go to projects with local support and buy-in.

The key tactic for addressing NPS pollution is to get effective conservation BMPs on the landscape. The state will implement and demonstrate proven as well as innovative water quality improvement practices, through new and existing projects, to address water quality concerns and raise awareness and adoption of newer, innovative practices.

The DNR will support existing and new projects by providing technical assistance, water quality monitoring, and project staffing. The agency will also collect information on water quality improvement successes and share this information with local, statewide, regional, and national audiences.



### PROTECTING IOWA'S WATERS



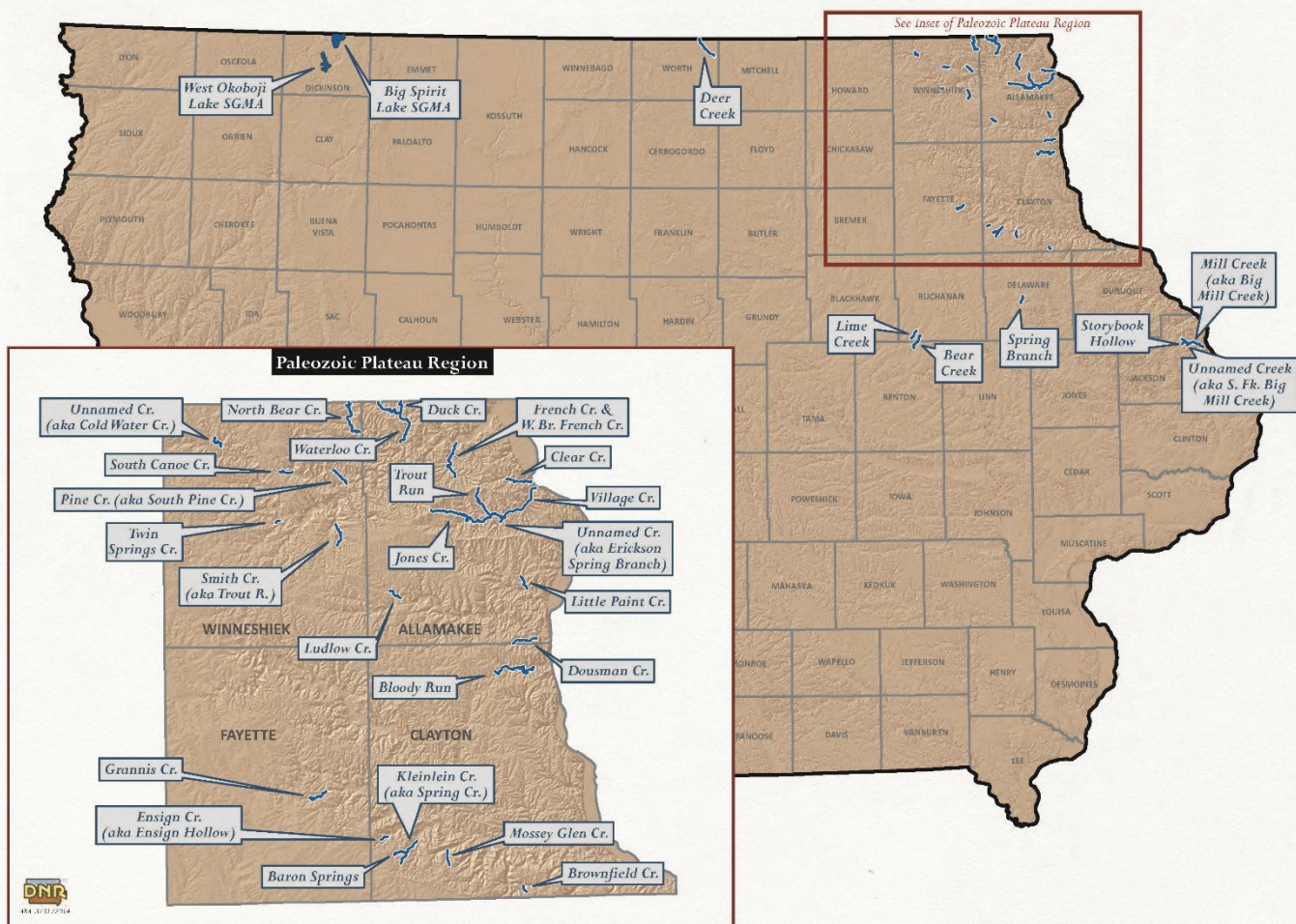
#### OUTSTANDING IOWA WATERS

The Outstanding Iowa Waters list includes 35 streams and lakes deemed particularly important waters of the state based on their water quality. A map of the Outstanding Iowa Waters can be found on the following page.

These high-quality water bodies receive particular protection to sustain their water quality, maintain existing uses, and prevent unnecessary pollution.

<sup>1</sup> Outstanding Iowa Waters list: [https://www.iowadnr.gov/Portals/idnr/uploads/water/standards/outstanding\\_iowa\\_waters.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/water/standards/outstanding_iowa_waters.pdf)

# Outstanding Iowa Waters



## 2. Improving Iowa Waters Affecting Public Health

Protecting public health is a critical pollution reduction goal. Nonpoint source pollution in Iowa creates serious public health risks, primarily from exposure through drinking water sources and recreational waterways.

For known public health risks, such as nutrient pollution that causes elevated nitrate levels in drinking water, education and outreach are key to making sure Iowans are aware of the risks and the steps being taken to mitigate them. The DNR also helps to implement plans designed to tackle specific public health risks, such as source water protection plans and beach risk reduction plans.

For emerging contaminants, which are less well known and understood, the DNR must establish risk thresholds and inform the public of risks, mitigation efforts, and new information as it becomes available.



### LAKE QUALITY HOLDS WATER

Statewide respondents to the Iowa Lakes Valuation Project<sup>2</sup> survey identified **water quality as the most important factor in deciding which lakes to visit for recreational purposes.**

<sup>2</sup> The Iowa Lakes Valuation Project 2019: Summary and Findings, [https://www.card.iastate.edu/lakes/data/surveys/iowa\\_lakes\\_survey\\_report\\_2019.pdf](https://www.card.iastate.edu/lakes/data/surveys/iowa_lakes_survey_report_2019.pdf)



Improving mental and physical health through outdoor recreation is an important outcome of having a clean, healthy environment for Iowans to enjoy. Water quality improvement planning and BMP implementation can incorporate outdoor recreation components to improve public health and wellness, in support of Iowa's 2023-2027 State Health Improvement Plan.<sup>3</sup> Such considerations can provide important co-benefits to water quality improvement projects and conservation practice implementation.

### **3.Improving Iowa's Waters for Native Wildlife and Fish, and Recreation**

Iowa is home to uniquely beautiful landscapes and creatures. Watershed improvement efforts need to incorporate protecting, improving, and restoring sensitive habitats in riparian and upland areas. These improvements not only benefit the landscape and the wildlife who live there, but offer multiple benefits of increased public recreation opportunities and the economic investment that comes with them.

The DNR will focus efforts on restoring recreational waters with aquatic impairments to their intended uses with both established and innovative practices that include habitat enhancement for species of concern. For instance, oxbow wetlands provide multiple benefits—water quality and quantity benefits, as well as critical habitat for Topeka shiners. Additional focus will be on restoration efforts that benefit sensitive and desired species, such as native brook trout in northeast Iowa. Where applicable, projects will consider safe public boating, fishing, and swimming access.

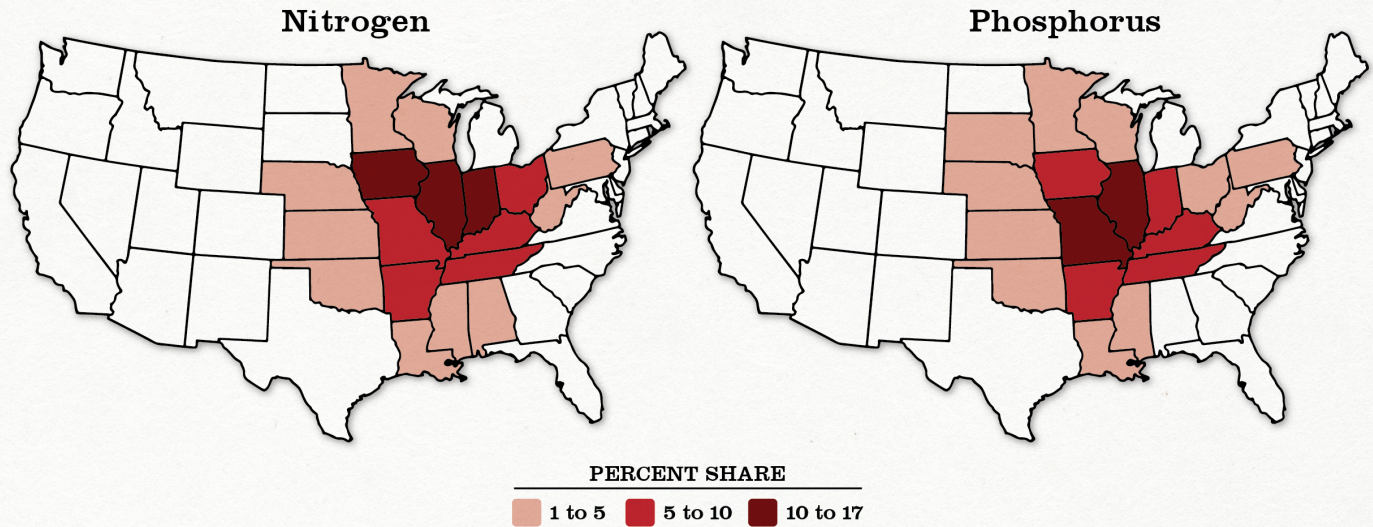
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<sup>3</sup> Iowa's 2023-2027 State Health Improvement Plan,  
<https://hhs.iowa.gov/sites/default/files/idphfiles/Published%202023-2027%20State%20Health%20Improvement%20Plan.pdf>

#### 4.Reducing Excess Nutrient Delivery to Iowa Waters

Many of Iowa's streams, rivers, and lakes carry elevated nutrient loads, and Iowa contributes significant nutrient pollution to the Mississippi River and Gulf of Mexico.<sup>4,5</sup> State-by-state nutrient contributions to the Gulf of Mexico are illustrated in the maps below.

#### Nutrient Delivery to the Gulf of Mexico from the Mississippi River Basin<sup>6</sup>



Because most of this pollution comes from nonpoint sources, addressing nutrient pollution is a particular focus of nonpoint source pollution management. This includes monitoring nutrients of concern in new and existing watershed projects, designing and implementing nutrient-reduction practices, and monitoring nutrient loads following implementation to ensure BMPs are successfully reducing pollution. The DNR will continue to support and participate in local, state, and federal programs to reduce nutrient pollution, including the Iowa Nutrient Reduction Strategy.

4 Robertson, D.M. and Saad, D.A. (2021) Nitrogen and Phosphorus Sources and Delivery from the Mississippi/Atchafalaya River Basin: An Update Using 2012 SPARROW Models. *Journal of the American Water Resources Association* 57 (3): 406– 429. <https://doi.org/10.1111/1752-1688.12905>

5 Iowa Nutrient Reduction Strategy, <https://www.nutrientstrategy.iastate.edu/documents>

6 USGS National Water-Quality Assessment (NAWQA) Project, Differences in Phosphorus and Nitrogen Delivery to the Gulf of Mexico from the Mississippi River Basin: [https://water.usgs.gov/nawqa/sparrow/gulf\\_findings/by\\_state.html](https://water.usgs.gov/nawqa/sparrow/gulf_findings/by_state.html)

## SECTION 3: IMPROVING IOWA'S SURFACE WATER AND GROUNDWATER QUALITY

The primary goal of Iowa's NPSMP is to improve surface water and groundwater quality in the state. Drinking water, recreational opportunities, and habitat and ecosystem services depend on healthy waters.

### **Specific action steps for pursuing this goal of improving Iowa's surface water and groundwater quality include—**

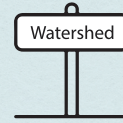
- Fostering the development of new projects with monitoring, assessment, and planning in areas of state- and locally determined priority plans (TMDLs, nine-element watershed plans to restore impaired waters, alternative watershed improvement plans, and comprehensive water quality plans).
- Supporting existing and new projects by providing technical assistance, water quality monitoring, and project personnel.
- Encouraging and supporting research by Iowa State University, University of Iowa, University of Northern Iowa, and other organizations on the social challenges, emerging practices, and innovative solutions to improving the health of Iowa's surface water and groundwater.
- Implementing and demonstrating both established and innovative water quality improvement BMPs to address water quality concerns, raise awareness of emerging practices, and strive for healthier ecosystems that support the interplay of water and soil.
- Collecting information on water quality improvement and healthy ecosystem successes and sharing this information about the benefits of existing and innovative practices with local, statewide, regional, and national audiences in creative and effective ways.

Implementing watershed improvement projects is key to mitigating pollution in Iowa's waterways. The DNR takes the lead on water quality improvement through monitoring and assessment of pollution levels in Iowa waters. The agency develops watershed plans and assists others with watershed planning efforts, detailed in Section 1. Whether for new or existing projects, the DNR provides support through technical assistance, water quality monitoring, and project staffing.

The DNR develops the key document for an impaired water body, the TMDL—a watershed study and plan for improvement in one document. TMDLs are written to include the contribution of pollutants from both point and nonpoint sources (and in-lake sources, for lakes). Iowa DNR began calling completed TMDLs Water Quality Improvement Plans to better identify the documents to the public. TMDLs typically apply to impaired waters; they focus on studying the causes of impairment and recommending BMPs to restore the water body. There is also a protection-based TMDL, which identifies how to protect, rather than restore, a water body.

Completed TMDLs are used to create nine-element watershed plans, which the EPA must approve before CWA Section 319 funding can be awarded for project implementation work.

### CITIZEN ACTION STEPS

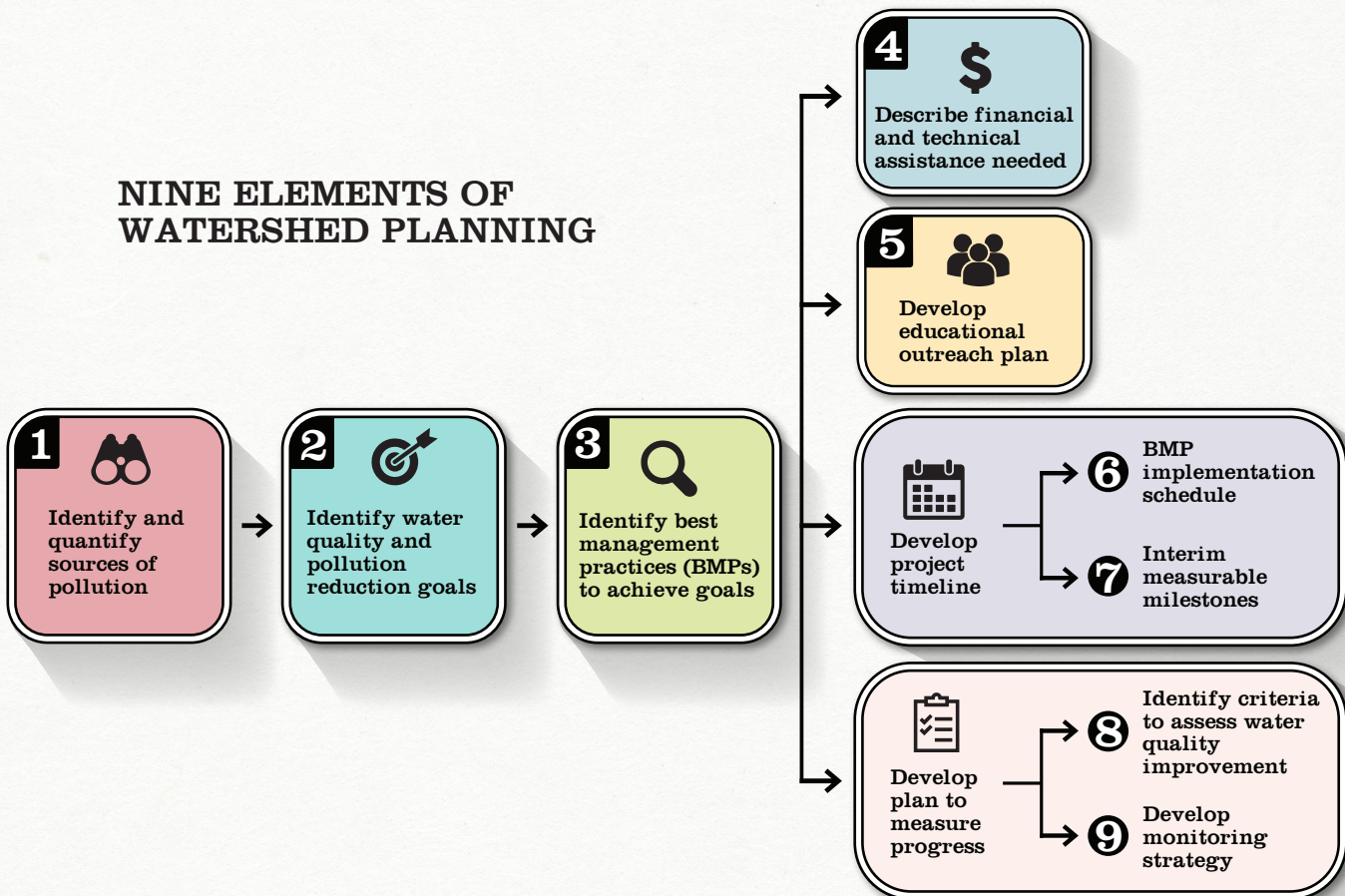


Keep an eye out for road signs identifying watershed boundaries



Find your watershed in EPA's How's My Waterway? portal: <https://mywaterway.epa.gov/>

### NINE ELEMENTS OF WATERSHED PLANNING



## SECTION 4: IMPROVING WATERS THAT AFFECT PUBLIC HEALTH

Recognizing the interconnected public health and safety implications of NPS pollution, efforts to increase awareness of the public health risks related to NPS pollution and water quality are integral to Iowa's Nonpoint Source Management Plan.

### Specific action steps for pursuing this goal of improving waters that affect public health include—

- Informing the public through a variety of outreach mechanisms of the risk levels for known and emerging contaminants and providing science-based data for making informed decisions.
- Educating the public on how to reduce known and emerging public health risks, such as pollutants that affect drinking water sources, and on nonpoint source mitigation methods underway to enhance public health and safety in Iowa's waters.
- Implementing plans and programs that directly impact public health, such as approved Source Water Protection Plans, approved Beach Risk Reduction Plans, and private well protection programs.
- Enhancing walking/biking areas adjacent to public water quality practice sites to expand the health and education benefits of Iowa's outdoor spaces and thriving ecosystems.

### 4.1 PROTECTING PUBLIC WATERS THROUGH EDUCATION AND MITIGATION

The EPA defines public health as organized measures to prevent disease, promote health, and prolong life. Striving to enhance public health and safety in Iowa's waters, this plan focuses on two key public health tenets: protecting drinking source water and protecting recreational waters.

#### 4.1.1 Protecting Source Water

"Source water" describes drinking water in its original environment, either as surface water (rivers, streams, reservoirs, lakes) or as groundwater (aquifers), before it is withdrawn, treated, and distributed by a water system.<sup>1</sup> Numerous statewide initiatives currently support source water protection—which focuses on preventing contaminants from entering drinking water sources—through education and best management practice implementation.

Iowa DNR's Source Water Protection Program oversees the state's source water protection efforts for public water supplies, with Source Water Protection Plans (SWPPs) developed and implemented through a multistep collaborative process. Developing a Source Water Protection Plan, on [page 23](#), details the comprehensive process of bringing such a plan to fruition. Funds for implementing practices that aid in protecting source water are available through the NRCS.

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<sup>1</sup> <https://www.iowadnr.gov/Environmental-Protection/Water-Quality/Source-Water-Protection>

For nonpublic water supplies, such as private wells, the Grants to Counties (GTC) Water Well Program assists private well owners in protecting source water. Established in 1987 with passage of the Iowa Groundwater Protection Act, GTC provides funds to county health departments to assist local residents with well-water-related services, including private well testing, inspection, renovation, and closure.

Rural Iowa farms and households using private wells as their primary drinking water source are particularly susceptible to potential health impacts because testing of private wells is not required (as it is for public water supplies)—thus private well users may have contaminated water and not know it. Despite low- or no-cost private well water testing available through the GTC program, **the Iowa Rural Drinking Water Survey<sup>2</sup> found that only 10 percent of households tested their well water quality in the last year.** One-third of households are at particularly high risk of nitrate exposure due to a lack of testing, filtering, or other protective measures.

Iowa's Clean Water SRF provides low-interest loans for nonpoint source water pollution control projects across the state. In addition to assisting public water supplies, a portion of SRF funds can be utilized by nonpublic entities. The onsite wastewater treatment and disposal systems set-aside program is intended to assist homeowners with rehabilitating or improving existing septic and other onsite wastewater treatment and disposal systems—protecting public health by reducing the potential for human waste and bacteria to enter source water.



### **PUBLIC WATER SUPPLY SYSTEMS—**

Provide water for human consumption with at least 15 service connections or serving at least 25 people at least 60 days during the year.

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<sup>2</sup> [https://www.conservationlearninggroup.org/files/page/files/report-iowaruraldrinkingwatersurvey-final\\_1.pdf](https://www.conservationlearninggroup.org/files/page/files/report-iowaruraldrinkingwatersurvey-final_1.pdf)



## DEVELOPING A SOURCE WATER PROTECTION PLAN

Developing a SWPP is fundamental to protecting public drinking water supplies. There are multiple ways to initiate the SWPP development process:

- DNR staff (e.g., source water coordinator, water quality improvement staff member, or field office staff member) identifies a public water supply as potentially benefiting from SWPP development. DNR staff previously developed a priority list of communities based on population, susceptibility of water source to contamination, nitrate concentration in the drinking water source, and the age of any prior SWPP. While DNR staff are encouraged to work with communities from this list, they can also assist interested communities not on the priority list.
- Public water supply contacts DNR to express interest in developing a SWPP.
- Source water protection planner with another organization (e.g., Iowa Rural Water Association) contacts a public water supply to assist them in developing a SWPP.
- A funding source, such as EPA, becomes available to provide financial assistance for developing SWPPs. DNR, a public water supply, or another interested party may initiate the conversation regarding SWPP development.

Once a public water supply decides to pursue a SWPP, the plan is developed through a multistep, collaborative process:

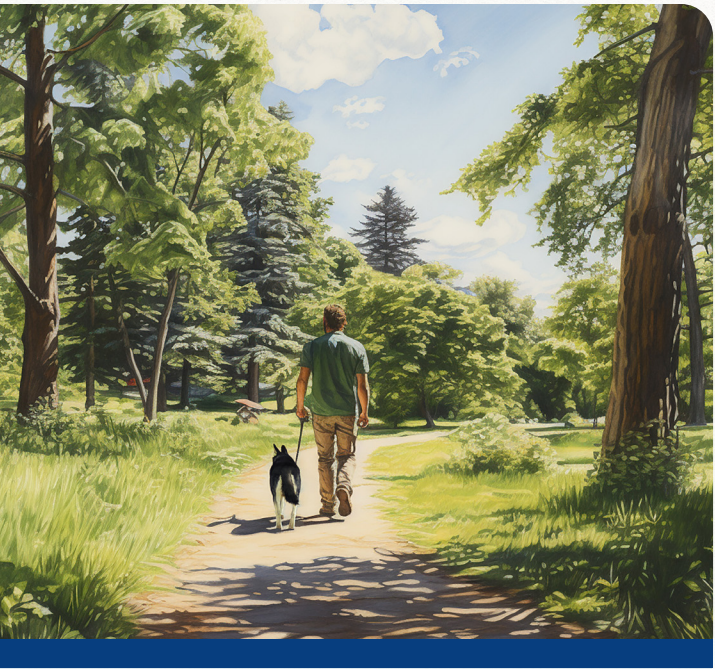
**Assessment (Phase 1):** DNR source water protection staff (or other qualified source water planners) conduct assessments detailing the water system's active wells, delineating the source water protection area, determining the susceptibility to contamination, and providing potential contamination sources. DNR source water protection staff (or other qualified source water planners) hold meetings with local public water supply employees, board members, and landowners to provide overviews of the planning process, assessments conducted, and financial or technical assistance that may become available through completion and implementation of the plan.

**Planning (Phase 2):** Through a collaborative team effort, a SWPP is developed. The Iowa Source Water Protection Guidebook<sup>3</sup> provides the team with templates and process guidance to determine how the system will protect its drinking water resource. SWPP drafting and compilation are typically completed by a team that includes DNR source water or water quality improvement staff and an Iowa Rural Water Association planner, or another planner under contract to complete a SWPP—in conjunction with local public water supply representatives, NRCS, and local stakeholders (e.g., farmers and landowners) of the source water protection area. Draft SWPPs are submitted to Iowa DNR, and reviewed by DNR source water staff (and in some cases, water quality improvement and field office staff). Upon approval, Phase 2 SWPPs are saved in the DNR Source Water Protection Tracker database.<sup>4</sup>

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<sup>3</sup> <https://www.iowadnr.gov/Portals/idnr/uploads/water/wse/SWPPGuidebook.pdf>

<sup>4</sup> <https://programs.iowadnr.gov/sourcewater/>



### CITIZEN ACTION STEPS



Pick up and dispose of pet waste



Dispose of old and unused medications at a pharmacy drop box or take-back day (do not flush them down the toilet)



Test your tap water once per year if using a private well



Check the DNR Beach Monitoring Website or Hotline for up-to-date water quality conditions at public beaches

#### 4.1.2 Protecting Recreational Waters

Popular venues for boating, fishing, and swimming, Iowa's recreational waters traditionally see frequent use each year from Memorial Day to Labor Day. Through its State Park Beach Monitoring Program,<sup>5</sup> the DNR actively conducts water quality monitoring at all of the state park beaches and many locally managed beaches in Iowa (collectively referred to as public beaches) throughout the summer season, with bacteria (e.g., *E. coli* and bacteria linked to fecal coliform) and blue-green algae toxins (e.g., microcystin) of particular concern for public health.

DNR efforts include detailed monitoring of pollutants at public beaches, identifying pollutant issues and linking them to Iowa DNR nonpoint source programming, and providing available resources to address identified pollutants of concern for public health. Research into beach contamination, associated public health risk, and new risk-tracking measures is ongoing by the DNR, and will continue during the active term of this edition of the NPSMP.

To better address public health and safety implications of Iowa's recreational waters, the DNR is actively developing a series of Water Quality Improvement Plans (WQIPs) for public beaches across the state. These plans form the basis of what will ultimately become "beachshed"-specific risk reduction plans.

Grounded in beach-specific water quality monitoring data, Beach Risk Reduction Plans will emphasize BMPs to target reductions in bacteria (*E. coli* and fecal coliform), blue-green algae (harmful algal blooms), and other identified pollutants of concern that pose risks to public health. Providing public education on water quality issues and conditions is central to protecting the health and safety of Iowa's recreational water users, and Beach Risk Reduction Plans are essential to supporting this effort.

<sup>5</sup> <https://www.iowadnr.gov/things-to-do/beach-monitoring>



## IMPROVING WATER QUALITY AT IOWA'S BEACHES

The DNR is currently developing a series of WQIPs—also referred to as TMDLs—for public beaches across the state. These plans are developed in phases and then submitted to the EPA for approval. To date, the EPA has approved two rounds of Iowa's Statewide Beach Bacteria TMDLs:

**Round 1:** Hickory Grove Lake, Clear Lake, and Nine Eagles Lake<sup>6</sup>

**Round 2:** Brushy Creek Lake, Lake Ahquabi, and Lake Macbride<sup>7</sup>

These current WQIPs form the basis of what will become Beach Risk Reduction Plans, intended to identify and implement specific best practices at public beaches to reduce the primary pollutants of risk to public health.

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Anticipated roles and collaborators on Beach Risk Reduction Plan development and implementation include:

### **Development of beach-based WQIPs—**

DNR Water Quality Monitoring and Assessment Section-TMDL Program

### **Development of beach risk reduction plans, starting from existing WQIPs and including risk research—**

DNR Water Quality Improvement Section 319 Program, with Water Quality Monitoring and Assessment Section input

### **Implementation of public beach-based improvements—**

DNR Water Quality Improvement Section 319 Program, with Water Quality Monitoring and Assessment Section input

### **Development of a suite of BMPs to address beach-centric risk reduction NPS issues—**

DNR Water Quality Improvement Section 319 Program, with input from Land, Waters, and Engineering Bureau

### **Long-term surveillance monitoring at public beaches across the state—**

DNR Water Quality Monitoring and Assessment Section-Beach Monitoring Program

### **Synthesis and delivery of public health information related to beach risks—**

Iowa Department of Health and Human Services

*According to a 2019 survey, single-day users spend **\$1.2 billion annually—an average of \$7.4 million per lake—while visiting Iowa lakes.***



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<sup>6</sup> [https://www.iowadnr.gov/Portals/idnr/uploads/water/watershed/tmdl/files/final/StatewideBeachBacteriaROUND1\\_FINAL.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/water/watershed/tmdl/files/final/StatewideBeachBacteriaROUND1_FINAL.pdf)

<sup>7</sup> [https://www.iowadnr.gov/Portals/idnr/uploads/water/watershed/tmdl/files/final/StatewideBeachBacteria\\_Addendum1.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/water/watershed/tmdl/files/final/StatewideBeachBacteria_Addendum1.pdf)

## 4.2 IMPLEMENTING APPROVED PLANS TIED TO PUBLIC HEALTH

Upon approval of plans for Iowa's source water and recreational waters, implementation is critical for ensuring the public health and safety of Iowans using these water resources. This section details implementation of source water protection plans and beach risk reduction plans.

### 4.2.1 Implementing Source Water Protection Plans

Implementation involves applying site-suitable BMPs in alignment with assessed needs, to address specific action steps the community will take to protect its drinking water resource. Funds for implementing practices that protect source water are available through multiple USDA programs.

#### TAKING ACTION: SWPP IMPLEMENTATION

**Implementation (Phase 3):** Following DNR approval, the SWPP is implemented, applying BMPs and addressing the specific items the community will use to protect its drinking water resource.

Each SWPP's location is added to a map of approved source water protection areas (for both groundwater and surface water systems), updated annually, and shared with the Iowa NRCS. The NRCS uses the map to designate these areas as eligible for source water implementation funding through four different programs—the Environmental Quality Incentives Program (EQIP), Agricultural Conservation Easement Program (ACEP), Conservation Stewardship Program (CSP), and Regional Conservation Partnership Program (RCPP) Source Water funding program. Source water protection implementation is designated at 10 percent of these programs' annual funding allocations.

DNR source water protection staff provide training to NRCS staff on approved source water protection areas in Iowa, and provide an overview of the source water protection planning and implementation processes.

### 4.2.2 Implementing Beach Risk Reduction Plans

Following Beach Risk Reduction Plan development, implementation is specific to each site and draws from the suite of DNR-identified BMPs that help address common beach-centric nonpoint source issues. Implementation is a collaborative effort of the DNR Water Quality Improvement Section 319 Program, the DNR Land, Waters, and Engineering Bureau, and the Iowa Department of Health and Human Services. A specific implementation schedule for Beach Risk Reduction Plans has not yet been established. Long-term surveillance monitoring of public beaches is ongoing by the DNR and will continue during the active term of this edition of the Nonpoint Source Management Plan.

## 4.3 EMERGING CONTAMINANTS

Emerging contaminants are those that have been recently detected or discovered in surface waters or groundwater through monitoring, although the specific contaminants may have been present in the environment for a while. Emerging contaminants aren't usually categorized as either point or nonpoint sources as they appear, but are first assessed for their risk to human safety, public health, and environmental health. From pesticides to pharmaceuticals to blue-green algae, emerging contaminants are of growing concern in Iowa's waters. Several programs monitor for emerging contaminants across Iowa, with monitoring efforts detailed in *Emerging Contaminants: A Closer Look*, on the following page.

In addition to water quality monitoring, public education and engagement are key. Working toward enhanced public health and safety of Iowa's waters, informing Iowans of known risk levels, and establishing risk thresholds for emerging contaminants is essential.

## EMERGING CONTAMINANTS: A CLOSER LOOK

### WHICH EMERGING CONTAMINANTS ARE ON THE RADAR IN IOWA?



#### **Pesticides and pharmaceuticals**

Pesticides are transported to Iowa's waters via nonpoint source pathways, primarily from agricultural lands. Pharmaceuticals pass through the human body, exit as waste, and even after passing through wastewater treatment plants and septic systems, can persist in Iowa's waters. Pharmaceuticals from livestock use are also increasingly present in soil and water.<sup>8</sup> Together, pesticides and pharmaceuticals include thousands of chemical compounds with widely varying degrees of toxicity, persistence, and bioaccumulation potential. The DNR rotates monitoring of pesticides and pharmaceuticals into its Ambient Stream Monitoring routine approximately every five years, with monitoring of pesticides and pharmaceuticals most recently completed in 2020 and 2014.



#### **Blue-green algae**

Blooms of blue-green algae, also referred to as "Harmful Algal Blooms" (HABs), are fueled by excess waterborne nutrients, which come primarily from Iowa's vast agricultural lands. Blue-green algae blooms are highly dynamic, exhibiting wide seasonal fluctuations, and are of particular concern due to their potential to release harmful cyanotoxins (e.g., microcystin). The DNR actively monitors water bodies for indicators of blue-green algae through its Ambient Stream Monitoring, Ambient Lake Monitoring, and State Park Beach Monitoring Programs. Between these three programs, select water bodies are monitored for algal pigments (chlorophyll and phycocyanin) and total microcystin, which serve as proxy indicators of blue-green algae.



#### **Per- and polyfluoroalkyl substances (PFAS)**

PFAS are widely used, long-lasting chemicals, components of which break down very slowly over time—lending these substances their moniker of "forever chemicals." There are thousands of PFAS chemicals, found in numerous consumer, commercial, and industrial products—making it particularly challenging to study and assess the potential human health and environmental risks. PFAS tend to be more frequently linked with point sources (e.g., nonstick substance manufacturing); however, many of these contaminants have the potential to impact waters via both point source and nonpoint source pathways. To address this class of emerging contaminants, the DNR has implemented a routine that includes monitoring PFAS in public water supplies. Iowa's Grants to Counties Program, which provides free private well water testing, is expanding its monitoring to include PFAS in pilot areas of the state. Additionally, the DNR's Water Quality Bureau has established a PFAS monitoring committee to coordinate monitoring efforts across the state.

<sup>8</sup> Soloman, Keith R., Hillis, Derek G., Lissemore, Linda, and Sibley, Paul K. 2009. Risks of agricultural pharmaceuticals in surface water systems and soil. In Henderson, Keri L. and Coats, Joel R. *Veterinary Pharmaceuticals in the Environment*. Volume 1018. American Chemical Society. 191-204. <https://doi.org/10.1021/bk-2009-1018.ch013>

#### 4.4 ENHANCING WALKING/BIKING AREAS NEAR PUBLIC WATER QUALITY PRACTICE SITES

Strategically enhancing walking/biking areas adjacent to water quality practice sites on public lands can accomplish paired public health and education benefits. Healthy ecosystems and aesthetically pleasing outdoor environments encourage people to spend time outdoors. Especially when it involves physical activity, time outdoors can lead to improved overall health and wellness (e.g., reducing stress and blood pressure). “Healthy eating and active living” is one of seven comprehensive priority areas in Iowa’s 2023–2027 State Health Improvement Plan,<sup>9</sup> and enhanced walking/biking areas near public water quality practice sites directly support this initiative through increased opportunities for physical activity and outdoor recreation.

Strategic interpretive signage could explain the reasoning behind BMPs that have been implemented, providing synergistic public education while also helping Iowans make stronger connections with their local water bodies and water sources. Attractive walking/biking areas paired with beneficial water quality practices offers multiple benefits, helping to foster an improved sense of place and pride in local communities and efforts to protect water quality for all Iowans.

**Healthy ecosystems and aesthetically pleasing outdoor environments encourage people to spend time outdoors.**



#### WATER TRAILS HIGHLIGHT RIVER AND STREAM RECREATION

Water trails offer a unique perspective for paddlers to experience Iowa’s rivers and streams. Recreational use of water trails lends public attention to the state’s surface waters, riparian landscapes, and interconnections between water quality and land management practices. The DNR’s Water Trails<sup>10</sup> program features plans related to recreation along water corridors, access to rivers and large streams, and directional and educational signage—enhancing the recreational experience and helping reconnect Iowans to the state’s history, heritage, geology, and wildlife.

<sup>9</sup> Iowa’s 2023–2027 State Health Improvement Plan, <https://hhs.iowa.gov/sites/default/files/idphfiles/Published%202023-2027%20State%20Health%20Improvement%20Plan.pdf>

<sup>10</sup> <https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Water-Trail-Maps-Brochures>

## SECTION 5: IMPROVING IOWA'S WATERS FOR NATIVE WILDLIFE AND FISH, AND RECREATION

Iowa is home to uniquely beautiful landscapes, and a rich variety of plants and animals that depend on them for survival. Many Iowans enjoy outdoor recreation; from paddling, running, and biking to hunting and fishing, Iowa has plenty for outdoor enthusiasts to enjoy. Protecting the quality of these outdoor spaces through diverse upland, streamside, and instream practices that positively influence outcomes for aquatic life is critical not only to maintain an important economic driver in the state, but also to preserve Iowa's natural heritage and to make Iowa a more desirable place to live, work, and raise families.

**Specific action steps for pursuing this goal of improving Iowa's waters for native wildlife and fish, and recreation, include—**

- Protecting, improving, and restoring riparian and upland ecosystems and habitats as part of water quality improvement efforts aligned with improved public access and recreational use.
- Prioritizing lake, wetland, and stream restoration efforts that benefit native species of concern or desired species.
- Restoring highly used recreational waters with aquatic-related impairments to provide safe public access to waters for fishing and boating, and to enhance fishing success.

### KEY TERMS

#### **Ecosystem**

A community of organisms interacting with one another and their environment.

#### **Habitat**

The area and resources used by a particular species.

#### **Endangered species**

Any species that is in danger of extinction throughout all or a significant part of its range. Endangered species are protected by law.

#### **Threatened species**

Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Threatened species are protected by law.

#### **Species of concern**

Any species about which problems of status or distribution are suspected, but not documented. Species of concern are not protected by the Iowa Threatened and Endangered Species law, but many animal species of concern are protected under other state and federal laws addressing hunting, fishing, collecting, and harvesting.

#### **Desired species**

Rare or important species, which includes endangered species, threatened species, species of concern, and the critical habitat required by these species.

#### **Riparian management**

Management of streambanks, floodplains, wetlands, and other systems that neighbor bodies of water.

## 5.1 PROTECTING, IMPROVING, AND RESTORING HABITATS IN RIPARIAN AND UPLAND AREAS

Habitat restoration should be part of watershed planning processes wherever applicable. Watershed and water quality improvement activities should include practices with multiple benefits and align with improvements to public fishing areas, public boat access areas along rivers and lakes, public hunting areas, and public wildlife areas, and along public hiking, biking, and water trails.

Water quality in Iowa's recreational lakes is particularly important to economic development in the state. According to a 2019 survey, single-day users spend \$1.2 billion annually—an average of \$7.4 million per lake—while visiting Iowa lakes.<sup>1</sup> Iowans in the same survey reported that water quality is the most important factor in choosing a lake for recreation.<sup>2</sup> Additionally, 56 percent of survey takers had heard of HABs at Iowa lakes and 32 percent had seen large algal blooms, which indicates that Iowa lake users are concerned about public health risks from HABs. NPS pollution efforts to reduce phosphorus in lake watersheds would likely reduce the frequency and severity of HABs and make lake users more confident about their health and safety in Iowa lakes.

The goals of this section of the NPSMP should align with the goals and priorities of the DNR Lake Restoration Program,<sup>3</sup> which are:<sup>4</sup>

- Delivery of phosphorus and sediment from the watershed will be controlled before lake restoration begins
- Shallow-lakes management will be considered among options for restoration
- Water quality targets:
  - Clarity—4½-foot Secchi disc transparency 50 percent of the time from April through September
  - Biota—A diverse, balanced, and sustainable aquatic community must be maintained
  - Impairment—Water quality impairments must be eliminated
  - Sustainability—Water quality and public use benefits must be sustained for 50 years

Iowa has abundant rivers and streams, many of which provide recreational opportunities for Iowans and critical habitat for key species like brook trout. The goals of this section should also align with river and river corridor priorities.<sup>5</sup> There are obvious opportunities for realizing multiple benefits between trout management goals and nonpoint source management goals.

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1 The Iowa Lakes Valuation Project 2019: Summary and Findings, [https://www.card.iastate.edu/lakes/data/surveys/iowa\\_lakes\\_survey\\_report\\_2019.pdf](https://www.card.iastate.edu/lakes/data/surveys/iowa_lakes_survey_report_2019.pdf)

2 Id.

3 <https://www.iowadnr.gov/Environmental-Protection/Water-Quality/Lake-Restoration>

4 [https://www.iowadnr.gov/portals/idnr/uploads/water/lakerestoration/lr\\_files/process.pdf](https://www.iowadnr.gov/portals/idnr/uploads/water/lakerestoration/lr_files/process.pdf)

5 [https://www.card.iastate.edu/research/resource-and-environmental/items/Rivers\\_Survey\\_Fact\\_Sheet.pdf](https://www.card.iastate.edu/research/resource-and-environmental/items/Rivers_Survey_Fact_Sheet.pdf)

## 5.2 PRIORITIZING RESTORATION EFFORTS FOR NATIVE SPECIES OF CONCERN AND DESIRED SPECIES

NPS pollution management efforts should strive to enhance or protect Iowa's threatened and endangered species.<sup>6</sup> Particular focus should be on watersheds with federal and state endangered aquatic species in Iowa.<sup>7</sup>

These kinds of collaborations can achieve multiple benefits, such as targeted water quality improvement alongside habitat restoration.<sup>8</sup> An example of this is a new effort by the DNR to develop an Aquatic Management Areas Program that adds new aquatic habitat objectives to existing wildlife habitat objectives at DNR Wildlife Management Areas.

In addition to supporting native species of concern and desired species, NPS pollution management efforts should work to remove or hinder the spread of aquatic invasive species in Iowa waters. Watershed planners should review Iowa's invasive species list to determine whether plan implementation can help to impede their spread. DNR staff can provide education and support to ensure compliance with Iowa's aquatic endangered species law.<sup>9</sup>

### TROUT RESTORATION AND MANAGEMENT IN NORTHEAST IOWA

*NPS management efforts are designed to align with the goals of the state's Trout Management Plan<sup>10</sup>:*

1. Maintain populations of native brook trout in the nine streams where they currently are known to exist.
2. Develop native brook trout populations in at least ten streams where they were not known to previously exist.
3. Maintain quality trout fishing opportunities in catchable-stocked streams and community trout fisheries that result in trout angler satisfaction of at least seven out of ten as measured by the Iowa Trout Angler Survey.
4. Evaluate management of all Iowa trout fisheries.
5. Expand trout fishing access in Iowa (e.g., building on the successes of the Community Trout Stocking Program).

### POLLINATOR HABITAT RESTORATION

Aligning NPS efforts with the establishment of new prairie and other native Iowa habitats can offer multiple benefits, enhancing habitat for native pollinators (e.g., the rusty patched bumble bee) and monarch butterfly species. Partner organizations include the Iowa Pollinator Working Group, the Iowa Monarch Conservation Consortium, United States Fish and Wildlife Service (USFWS), IDALS, DNR, and others.

### TOPEKA SHINER RESTORATION

DNR, USFWS, and partner organizations collaborated to restore Topeka shiner populations in conjunction with oxbow restoration activities in the state.

### FRESHWATER MUSSEL RESTORATION

Several native Iowa freshwater mussels are threatened or endangered. Focusing on waters with aquatic life impairments, the DNR was able to prioritize restoration activities based on data from Iowa's Statewide Mussel Survey, funded by a Section 319 grant.<sup>11</sup>

<sup>6</sup> <https://www.iowadnr.gov/conservation/iowas-wildlife/threatened-and-endangered>

<sup>7</sup> <https://www.iowadnr.gov/idnr/Fishing/Iowa-Fish-Species/Fish-Details/SpeciesCode/TOP?>

<sup>8</sup> <https://pollinators.ppem.iastate.edu/>, <https://monarch.ent.iastate.edu/>

<sup>9</sup> [https://www.iowadnr.gov/Portals/idnr/uploads/fish/files/AIS\\_FAQ.pdf](https://www.iowadnr.gov/Portals/idnr/uploads/fish/files/AIS_FAQ.pdf)

<sup>10</sup> [https://upperiowariver.org/wp-content/uploads/2020/06/Iowa-Trout-Management-Plan\\_FINAL.pdf](https://upperiowariver.org/wp-content/uploads/2020/06/Iowa-Trout-Management-Plan_FINAL.pdf)

<sup>11</sup> <https://publications.iowa.gov/31138/1/Jan.%2016%20EcoNewsWire.pdf>

### 5.3 RESTORING RECREATIONAL WATERS WITH AQUATIC LIFE IMPAIRMENTS

Studying impaired recreational waters with adequate existing assessment and monitoring data, DNR aquatic biologists identify watersheds or aquatic corridors that may be ready for restoration work. For watersheds with aquatic life impairments but inadequate monitoring data, DNR biologists identify targeted areas for more assessment and monitoring to inform future watershed and aquatic corridor work.

Completed TMDLs (Water Quality Improvement Plans)<sup>12</sup> should be implemented first—particularly those for recreational waters with aquatic life impairments, in which the waterway does not support the expected aquatic life.

Watershed and water quality improvement efforts should be aligned with safe public access principles.<sup>13</sup> Watershed projects should collaborate with and advertise efforts to provide new, safe, legal public accesses for lakes and streams, such as the Water Access Cost-Share Program.<sup>14</sup> Additionally, watershed projects should align with DNR Lake Restoration Program fishing access goals and guidelines where applicable.<sup>15</sup>

Five river segments<sup>16</sup> in Iowa are designated as Protected Water Areas (Scenic Rivers) due to outstanding cultural and natural resource value. Given this designation, these segments should also be the focus of NPS improvement efforts where applicable.



#### CITIZEN ACTION STEPS



Establish native landscaping to support water quality and wildlife



Clean, drain, and dry boats and equipment to protect water bodies from aquatic hitchhikers



Learn about Iowa's endangered species, threatened species, and species of concern in the Iowa Wildlife Action Plan: <https://www.iowadnr.gov/Conservation/Iowas-Wildlife/Iowa-Wildlife-Action-Plan>

<sup>12</sup> <https://www.iowadnr.gov/environmental-protection/water-quality/watershed-improvement/water-improvement-plans>

<sup>13</sup> Developing Water Trails in Iowa, <https://www.iowadnr.gov/portals/idnr/uploads/riverprograms/intro.pdf>

<sup>14</sup> <https://www.iowadnr.gov/Things-to-Do/Boating/Water-Rec-Access-Cost-Share>

<sup>15</sup> <https://www.iowadnr.gov/Fishing/About-Fishing-in-Iowa/Lake-Restoration-Program>

<sup>16</sup> The river segments include segments of the Wapsipinicon River, Middle Raccoon River, Upper Iowa River, Little Sioux River, and Boone River. <https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Caring-for-our-Rivers>



## SECTION 6: REDUCING EXCESS NUTRIENT DELIVERY TO IOWA WATERS

Nutrient pollution is one of the most common types of NPS pollution. Nutrient loss reduction means taking steps to prevent soil from losing nutrients (nitrogen and phosphorus) as water moves over and through the ground. Nutrients are added to the soil as fertilizer, making nutrient loss an economic loss for farmers who wanted nutrients taken up by crops instead of washed into waterways. Once in waterways, nutrients are costly and difficult to remove. Nutrient pollution threatens drinking water supplies (high nitrate concentrations in drinking water are linked to multiple negative health outcomes, including blue baby syndrome and various cancers), contributes to increasingly frequent harmful algal blooms, and ultimately contributes to the Gulf of Mexico dead zone at the mouth of the Mississippi River.

### Specific action steps for pursuing this goal of reducing excess nutrient delivery to Iowa waters include—

- Monitoring, tracking, and reporting nutrient loads in new and existing watershed projects as part of local water quality improvement efforts through practice implementation.
- Continued support of statewide monitoring of nutrient loads.
- Implementing nutrient-reduction practices for projects where nutrients are pollutants of concern.
- Participating in and supporting state and regional efforts to address nutrient loss and export, including Iowa's NRS and the Gulf of Mexico Hypoxia Task Force.
- Developing, assessing, and utilizing innovative technology, tools, and practices that support nutrient load reductions through strategic practice implementation.
- Supporting education and outreach efforts.

### NUTRIENT SOURCE CONTRIBUTIONS TO IOWA'S WATERS

#### TOTAL NITROGEN (N) LOSS



#### TOTAL PHOSPHORUS (P) LOSS





## CITIZEN ACTION STEPS



Attend a field day or workshop to learn about in-field, edge-of-field, and urban conservation practices in your area



Keep the soil covered:

- o No-till and strip-till
- o Cover crops
- o Native landscaping and buffer strips



Keep grass clippings off the street and away from storm drains

The Iowa NRS (adopted in 2013) includes a suite of practices that can be implemented to reduce nutrient pollution from both point sources and nonpoint sources. This NPSMP revision aligns with the Iowa NRS's approach to reduce nonpoint source nutrient loss. Currently in development, the Iowa Nutrient Reduction Exchange, a nutrient trading program, can serve as an additional mechanism for advancing implementation of nutrient-reducing NPS practices.

It is particularly important to monitor nutrient levels before and after practice implementation. The NRS's data-based Science Assessment estimates the amount of pollution various BMPs would mitigate. By monitoring actual water quality outputs from BMPs, the DNR and other agencies involved in planning, design, and implementation will be able to more effectively select and deploy BMPs to meet nutrient reduction targets. The alignment of this Plan with the NRS will enhance interagency cooperation in these efforts.

**Iowa's Nutrient Reduction Strategy includes practices that address both point sources and nonpoint sources.**

## SECTION 7: ADDITIONAL CONSIDERATIONS

Two additional considerations for environmental management plans are underserved communities and climate resilience. When possible, NPS management should take into account the ways in which pollution management decisions may be affected by and impact these additional considerations.

### ***Addressing NPS Pollution Affecting Underserved Communities***

Underserved communities are disproportionately affected by environmental degradation but have fewer resources to impact policies and decision-making on their behalf. Negative consequences of NPS pollution in underserved communities include polluted drinking water supplies, increased likelihood of flood and drought impacts, and lack of safe access to outdoor spaces. Actions that address this inequity include expanded engagement, investment, and capacity-building. The DNR will consider the current allocation of funds to underserved communities and work to increase funding to these communities to federally identified levels.<sup>1</sup>

The DNR will also engage in targeted outreach to ensure meaningful engagement and capacity-building in underserved communities, including offering language-accessible communication consistent with federal civil rights law.<sup>2</sup> The DNR may also adopt other EPA guidance for better supporting underserved communities in NPS management. The DNR will pay particular attention to feedback from local leaders in these communities, who know firsthand what barriers they face and what resources might be helpful.

### ***Addressing Climate Resilience***

Increasingly extreme weather patterns should be considered in any efforts to address NPS pollution, as increased frequency and intensity of rainfall can send more pollutants into waterways in shorter timeframes. Additionally, when there is rain after periods of drought, the resulting runoff and subsurface drainage water is likely to contain higher concentrations of nutrients and other pollutants that have built up in the soil over time. Changes in weather patterns, temperatures, and growing seasons have lasting implications for NPS pollution mitigation efforts, and climate resilience should be part of any planning and implementation process. At the federal level, the EPA<sup>3</sup> and USDA<sup>4</sup> are developing and implementing climate-smart initiatives and guidance for Section 319 grants. These new guidelines are set to be included in Section 319 program requirements by 2024. NRCS will provide technical and financial assistance to farmers in alignment with EPA's requirements.

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1 The White House, Justice40, <https://www.whitehouse.gov/environmentaljustice/justice40/>

2 Title VI of the Civil Rights Act of 1964, <https://www.dol.gov/agencies/oasam/regulatory/statutes/title-vi-civil-rights-act-of-1964#:~:text=No%20per,son%20in%20the%20United,activity%20receiving%20Federal%20financial%20assistance>

3 EPA Programs and Initiatives Addressing Climate Change in the Water Sector:

<https://www.epa.gov/climate-change-water-sector/epa-programs-and-initiatives-addressing-climate-change-water-sector>

4 USDA Climate-Smart Agriculture, <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/climate/climate-smart-mitigation-activities>

One particular area of concern within nonpoint source pollution management is increased public health risks from extreme-weather-related events. Iowa's NPSMP supports programs and practices that mitigate public health risks linked with changing weather patterns. These efforts aim to reduce—

- Excess nutrients reaching drinking water sources, including surface waters and groundwater.
- Nutrient export to Iowa waters that can lead to harmful algal blooms.
- Health risks at public swimming beaches and other swimming areas.
- Runoff from both agricultural and urban areas (while increasing water infiltration into the soil in targeted areas).
- Other (non-nutrient) pollutants to Iowa waters that can harm public health.

Iowa's NPSMP promotes collaboration between agencies, organizations, and communities to implement programs and practices that provide multiple benefits, simultaneously enhancing nonpoint source pollution mitigation and climate resilience.



## **WEATHER-RELATED PUBLIC HEALTH IMPACTS**

### **FLOOD WATERS RAVAGE SOUTHWEST IOWA**

*Glenwood wells and water treatment plant inundated following extreme storm*

The southwest Iowa city of Glenwood saw its water treatment infrastructure severely damaged by Missouri River flooding in March 2019. The flooding was caused by an extreme “bomb cyclone” storm, in which heavy rain fell on top of accumulated snow and rivers became clogged by ice jams, leading to rapid water level rise.

Despite Glenwood sitting outside of the Missouri River floodplain, this extreme storm inundated much of the city as well as its water treatment facility and intake wells. Residents faced multiple weeks of boil orders and pleas for water conservation, and 275,000 to 300,000 gallons of water had to be delivered daily by truck from the communities of Red Oak and Shenandoah.

## APPENDIX: ACRONYMS AND INITIALISMS

ACEP	Agricultural Conservation Easement Program
BMPs	Best Management Practices
CDI	Conservation Districts of Iowa
CLG	Conservation Learning Group
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
CWA	Clean Water Act
DNR	Department of Natural Resources
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FSA	Farm Service Agency
GTC	Grants to Counties
HAB	Harmful Algal Bloom
IDALS	Iowa Department of Agriculture and Land Stewardship
IFA	Iowa Finance Authority
IIHR	Iowa Institute of Hydraulic Research
ISU	Iowa State University
NPS	Nonpoint Source
NPSMP	Nonpoint Source Management Plan
NRCS	Natural Resources Conservation Service
NRS	Nutrient Reduction Strategy
RCPP	Regional Conservation Partnership Program
SRF	State Revolving Fund
SWCD	Soil and Water Conservation District
SWPP	Source Water Protection Plan
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WMA	Watershed Management Authority
WQI	Water Quality Initiative
WQIP	Water Quality Improvement Plan

