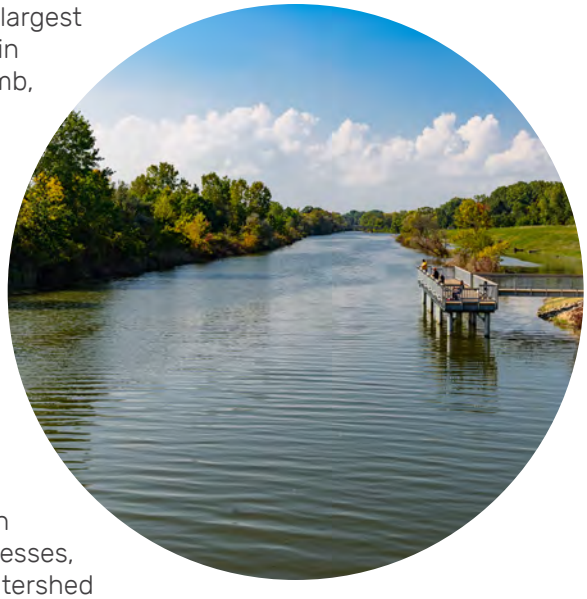
Clinton River

WATERSHED REPORT CARD

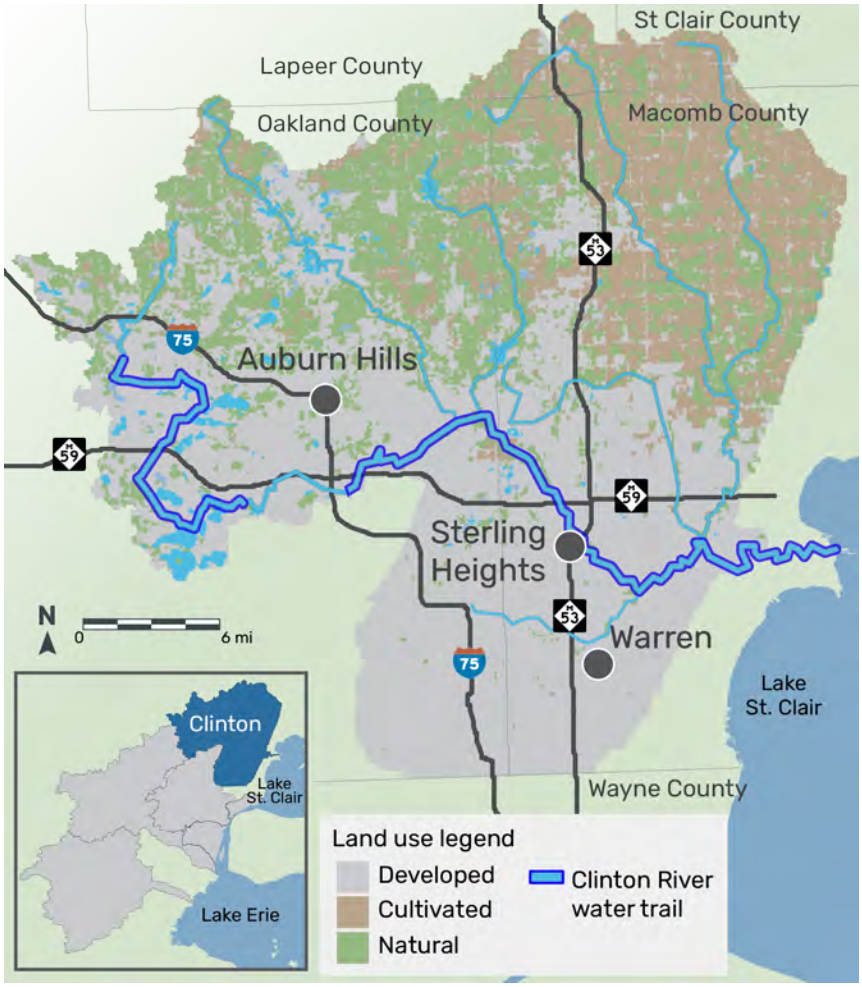
MICHIGAN'S CLINTON RIVER

The Clinton River Watershed is part of the Great Lakes Basin, one of the largest freshwater ecosystems in the world. It is the most populous watershed in Michigan, spanning 760 square miles over five counties: Oakland, Macomb, Lapeer, St. Clair, and Wayne. Historically, this region was home to the Odawa, Ojibwe, Potawatomi, and Wyandot peoples. The headwaters of the Clinton River's Main Branch begin in northwestern Oakland County and merge with two major tributaries, Stony Creek and Paint Creek. A favorite for trout anglers, Paint Creek is the only remaining designated coldwater trout stream in Southeast Michigan.



The Middle and North Branches of the Clinton River begin in rural areas of Lapeer and Macomb Counties and flow south to merge into the Main Branch in Clinton Township. The Main Branch travels 81.5 miles through marsh, forest, farmland, suburbs, and cities, meeting with Lake St. Clair in Harrison Township. Lake St. Clair is the 15th largest lake in the United States and is referred to as the 6th Great Lake. The Clinton River and Lake St. Clair together are drivers of outdoor recreation and tourism, provide critical fish and wildlife habitat, support local businesses, and provide people with important connections to nature. The upper watershed is less developed and provides more access to nature.

While the Clinton River is now known for its fish and wildlife habitats and recreational opportunities, this wasn't always the case. Rapid development and urbanization in the first half of the 20th century, along with a lack of clean water regulations, resulted in heavy pollution and contamination from point and nonpoint sources. In the 1960s, the Michigan Department of Natural Resources conducted a fish survey and found no living fish from Lake St. Clair to the City of Pontiac. The Clean Water Act of 1972 helped improve water quality, but the watershed continued to suffer from legacy pollution. In 1987, the Clinton River watershed was identified as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement with eight beneficial use impairments, seven of which are still being addressed.



HISTORY OF THE WATERSHED

For more than 50 years, the Clinton River Watershed Council (CRWC) has been working to protect, enhance, and celebrate the Clinton River, its watershed, and Lake St Clair. Through education, monitoring, stewardship, and restoration projects, CRWC works in partnership with individuals, communities, government agencies, and non-profit organizations to address the most significant threats to the watershed.

As the administrator of the Clinton River Area of Concern Public Advisory Council (stakeholders invested in restoring habitat, improving water quality, and reducing harmful algal blooms), CRWC is collaborating with partners to address threats and implement solutions. With time and effort, the Clinton River, its watershed, and Lake St. Clair are being restored.

INNOVATIVE **INFRASTRUCTURE** WILL AID STORMWATER **MANAGEMENT**

With over 55% of the land area in the watershed covered by impervious surfaces, stormwater management is the biggest challenge facing the Clinton River. When rain falls on hard surfaces like roads, parking lots, or buildings, water flows across the land, carrying pollutants like salt, oil, fertilizer, and sediment. This stormwater runoff degrades water quality as untreated water overflows into rivers and streams. Stormwater management systems are unable to cope with more frequent and intense precipitation from climate change. This can lead to increases in turbidity, bacteria, nitrogen, and phosphorus.

Poor water quality can lead to fish consumption advisories, which threaten food security for subsistence anglers reliant on these resources. Flooding is also a serious concern exacerbated by stormwater challenges. Without gray and green infrastructure solutions that help capture and slow down stormwater before entering storm drains, the human and ecological impacts of flooding will remain major concerns for communities.

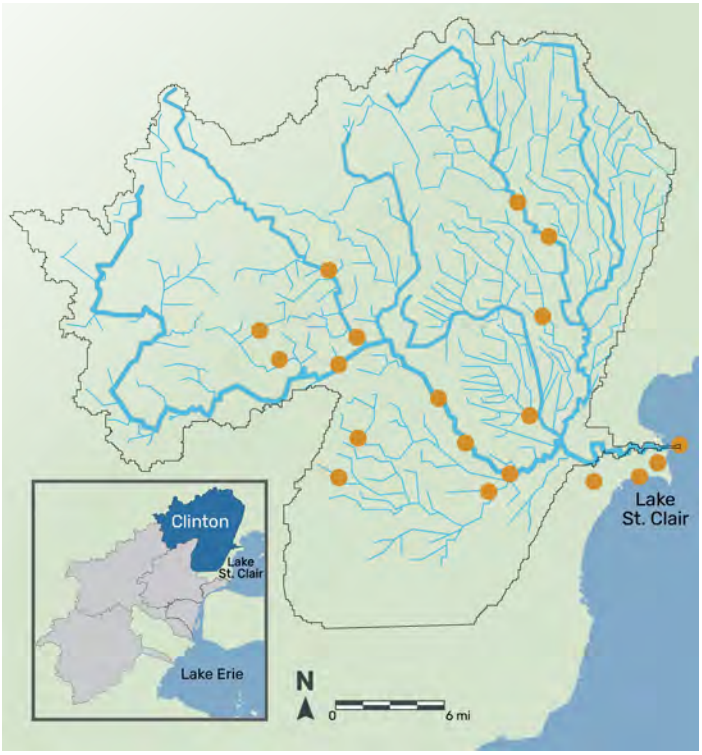
CRWC is working with stakeholders to implement solutions to sustainably manage stormwater and increase climate resilience. Innovative techniques that combine natural and engineered elements are being used to build bioswales, naturalize bioretention ponds, increase tree canopy cover, and help property owners install best rain management practices (like the rain garden in the photo to the right). These efforts will improve water quality across the watershed, but continued effort and funding is vital.

COLLABORATION IS KEY TO IMPROVING COMMUNITY AND **RIVER HEALTH**

CRWC works collaboratively with residents, schools, local, state, and federal governments, businesses, and other non-profit organizations to build partnerships and lead projects that address threats to the ecosystem, water quality, wildlife, people, and economy. Improving water quality, reducing pollutants, and restoring green spaces directly benefit people's health and improve quality of life. For more information on the actions that CRWC is taking in the Clinton River watershed, visit crwc.org

Since the Great Lakes Restoration Initiative began, over $40 million has been invested in the Clinton River Area of Concern (AOC) to complete 11 habitat restoration projects. Through the AOC, CRWC leads a workgroup to tackle harmful algal blooms that hurt tourism and degrade water quality. CRWC also leads projects to remove invasive species, manage large woody debris, restore fish passage, and re-establish native plant communities.

The health of the Clinton River watershed has improved since the 1960s—a direct reflection of the positive impact of collaboration and a roadmap for the future.



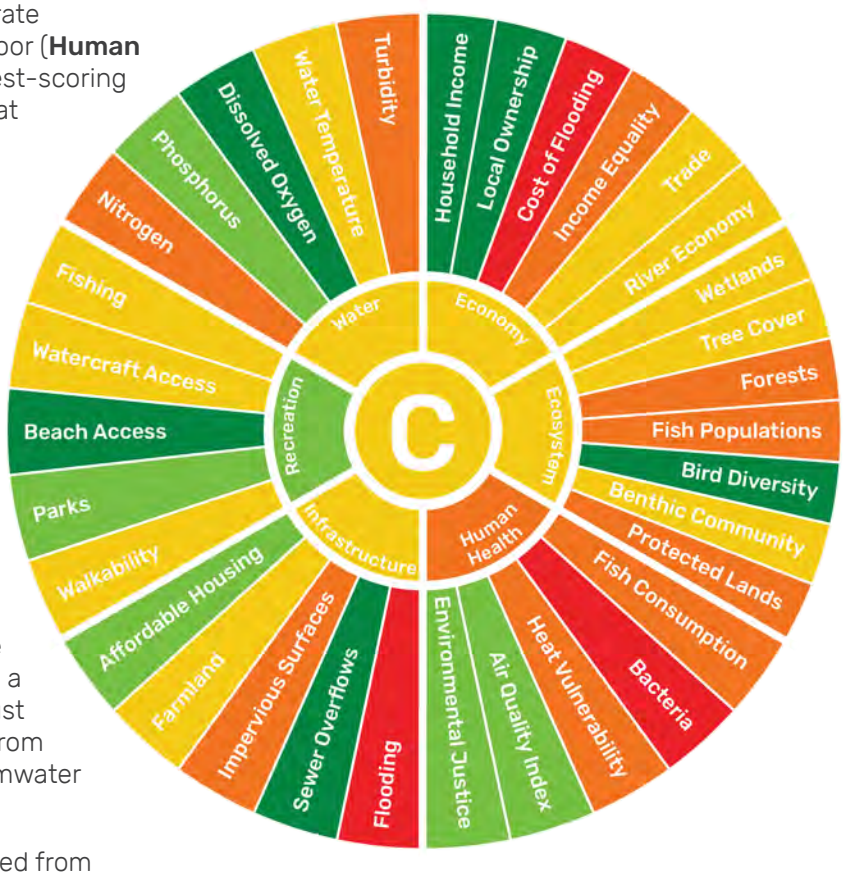
This map shows the restoration projects (orange circles) in the Clinton River Watershed completed as part of the Area of Concern project.

THE CLINTON RIVER AND ITS WATERSHED ARE IN **MODERATE CONDITION**

The Clinton River and its watershed were in moderate condition (51%, C). Category scores ranged from poor (**Human Health**, 39%) to good (**Recreation**, 64%). The lowest-scoring **Water** indicator was **Nitrogen** (25%), indicating that there is nutrient loading in the Clinton watershed. In the **Ecosystem** category, which received a moderate score (47%), scores ranged from poor (**Fish Community**, 28%) to very good (**Bird Diversity**, 93%).

The highest-scoring **Human Health** indicator was **Air Quality** (72%, B), while **Bacteria** received a score of 0% (F). Overall, **Human Health** was in poor condition (39%, D+). The highest-scoring **Infrastructure** indicator was **Sewer Overflows** (98%, A+), while **Flooding** received a score of 0% (F). Flooding in the Clinton was a serious issue, and all three of the failing indicators are linked to flood events and the impacts of flooding. The Clinton watershed only has one Combined Sewer, which did not have any overflows of untreated raw sewage, leading to a very good **Sewer Overflows** score. However, it must be noted that sections of the Clinton River suffer from frequent discharges of screened, disinfected stormwater and wastewater as a result of heavy rain events.

In the **Recreation** category (64%, B-), scores ranged from moderate (**Fishing Licenses**, 48%) to very good (**Beach Access**, 95%). The **Economy** is in moderate condition (51%, C). Economy indicator scores ranged from very poor (**Cost of Flooding**, 11%) to very good (**Household Income**, 88%). **Local Ownership** received a very good score, but **Income Equality** was low (21%, D-), and **Trade** and the **River Economy** were both in moderate condition.



Grade Scale

A	Very Good (100–80%)	B	Good (79–60%)	C	Moderate (59–40%)
D	Poor (39–20%)	F	Very Poor (19–0%)		

SOCIOENVIRONMENTAL REPORT CARDS ARE EFFECTIVE TOOLS FOR ASSESSMENT

Watershed report cards are powerful tools used around the world to describe ecosystem status, increase public awareness, and inform decision makers. This is the first Clinton River Watershed Report Card, which assesses the condition of the river itself as well as the surrounding watershed. The development of a watershed report card is collaborative. Stakeholders from a variety of backgrounds—scientists, researchers, government officials, business owners, and interested civilians—come together to define what is valuable about an ecosystem and what threatens that value. The resulting report cards are "socioenvironmental" because they contain more than just environmental concerns. A river's health is about more than its water quality and fish population; rivers have recreational and economic value to the people who live in their watersheds.

REPORT CARD **INDICATORS** EVALUATE **HEALTH**

The indicators used in this report card were carefully selected by a group of diverse stakeholders. The thresholds for each indicator are based on existing goals and determined by input from experts. Indicators are separated into six categories; each category score is the average of its component indicator scores. Category scores are averaged together to obtain the overall score for the Clinton River and its watershed. For detailed information on indicator thresholds and scoring, please visit **MichiganReportCards.org**

WATER

The **Water** category includes five indicators. **Nitrogen** measures the amount of total nitrogen in the water. **Phosphorus** measures the amount of total phosphorus in the water. High nutrient levels in a river lead to overgrowth of algae. **Dissolved Oxygen** measures the amount of oxygen dissolved in the water, which is good for animals. **Water Temperature** measures the temperature of the water; some fish species are sensitive to extreme temperatures. **Turbidity** measures the amount of light that passes through the water.

ECONOMY

The **Economy** category includes six indicators. **Household Income** measures the median household incomes in a community, while **Income Equality** measures the economic gap between the richest and poorest in a community. **Local Ownership** measures the locally owned businesses in a community by using company size as a proxy. **Cost of Flooding** measures the financial risk of flooding to a community. **Trade** measures the trade balance per capita, which assesses the amount of money leaving the local economy. **River Economy** measures the jobs and income generated by river-related businesses.

ECOSYSTEM

The **Ecosystem** category includes seven indicators. **Wetlands**, **Tree Cover**, and **Forests** evaluate the change in different types of land cover over time. Loss of natural land cover reduces available habitat, and often increases pollutant runoff. **Fish Populations** evaluates five metrics of the fish community structure based on different species types. **Bird Diversity** calculates the Simpson's Diversity Index for all bird species in the region; a higher number of bird species in an area means that there is adequate habitat available. **Benthic Community** evaluates the health of benthic macroinvertebrate species living on the stream beds, which reflects the overall health of the stream. **Protected Lands** measures the amount of land area protected in the region.

HUMAN HEALTH

The **Human Health** category includes five indicators. **Fish Consumption** assesses the type and severity of fish consumption advisories in the region. **Bacteria** assesses the amount of *E. coli* in the water, a proxy for other bacteria that can cause human illness. **Heat Vulnerability** is an index that assesses a community's vulnerability to climate change-driven heat waves. **Air Quality** assesses air pollutants and includes particulate matter (PM2.5) and ozone (O_3). The **Environmental Justice** indicator is an index developed by the CDC that integrates environmental, social, and health factors to assess the impacts of environmental inequality on human health. Environmental and economic inequality are often linked.

INFRASTRUCTURE

The **Infrastructure** category includes five indicators. **Affordable Housing** measures the amount people spend on housing costs compared to their income. **Farmland** evaluates the change in farmland area over time. Farmland maintains plant-based ground cover but can still contribute to water quality issues. **Impervious Surfaces** measures the amount of surfaces that are impervious to water infiltration in the region. **Sewer Overflows** evaluates the number of overflow events from Sanitary Sewer and Combined Sewer Systems. In the Clinton, there were eight Sanitary Sewers and one Combined Sewer that were assessed. **Flooding** evaluates the number of floods reported in a region.

RECREATION

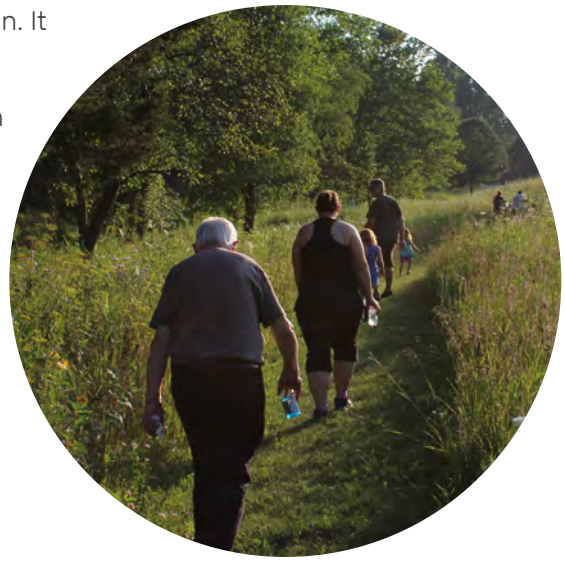
The **Recreation** category includes five indicators. **Fishing** measures the number of fishing licenses that have been issued. **Watercraft Access** measures the number of watercraft launch points along stretches of navigable river. **Beach Access** assesses the time when beaches are closed during the beach season. **Parks** assesses the median park size and percentage of park land in an urban area. **Walkability** assesses if people in urban areas can walk to a park in 10 minutes.

ACCESS TO RIVER RECREATION IS **EXPANDING**

Recreational access in the Clinton River watershed continues to improve as recreation on local waterways and within green spaces becomes more physically and socioeconomically accessible. Led by CRWC, the Clinton River became a designated state water trail in 2020. CRWC continues to lead efforts to improve access and safe recreation opportunities along the water trail, updating safety signage, launching and managing a Paddling App for the Clinton, and working with communities and CRWC River Stewards to keep the river passable for kayakers.

However, many communities within the watershed continue to be disproportionately impacted by persistent and systemic environmental injustices that affect access to the outdoors. Barriers to entry such as cost, access to equipment, knowledge of activities, and availability of accessible and safe green spaces can make it difficult or impossible for people living in these communities to engage in recreation. To start addressing these challenges, CRWC is working alongside communities to steward more parks and trails, update walking and boating infrastructure to increase physical access, and make educational resources available in Spanish and Arabic (the two languages spoken most frequently in the watershed after English). While much work remains to break down barriers to access, CRWC is committed to increasing programming, partnerships, and resources in authentic partnerships with communities across the watershed.

MOVING FORWARD IN A CHANGING WORLD



The Clinton River watershed is vital to the prosperity of southeast Michigan. It provides water for agriculture, small businesses, and industry, habitat for wildlife, and recreation opportunities for residents. Nearby Lake St. Clair draws over 17 million visitors a year to its freshwater coastline. The Clinton River also faces challenges tied to development and the increased impacts of a changing climate.

This report card outlines the current status of the river and its watershed, and the grades reflect historical and ongoing demands on natural resources. The Clinton River Watershed Council, businesses, residents, and local and county governments are actively facing these challenges. Their work in water quality monitoring, ecosystem restoration, and green stormwater infrastructure solutions is invaluable to the current and future health of the Clinton River and its watershed. Much work remains, and CRWC's commitment to building strong partnerships will continue as a driving force in creating a healthier watershed for the residents of SE Michigan.

ACKNOWLEDGMENTS

This report card is a timely, transparent assessment of the Clinton River and its watershed, which is the traditional land of the Odawa, Ojibwe, Potawatomi, and Wyandot peoples. This document was produced by the Clinton River Watershed Council and the University of Maryland Center for Environmental Science (UMCES). Funding was provided by the Fred A. and Barbara M. Erb Family Foundation. Council Fire, LLC was integral to developing economic indicators and consulted on economic data analysis. Over 100 stakeholders contributed to this project. All photos courtesy of the Clinton River Watershed Council.

Data sources include: Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry; Detroit Bird Alliance/Audubon Society; Federal Emergency Management Agency; Clinton River Watershed Council; Google Earth Engine; Implan; Michigan Department of Environment, Great Lakes, and Energy; Michigan Department of Health and Human Services; Michigan Department of Natural Resources; Multi-Resolution Land Characteristics Consortium; National Oceanic and Atmospheric Administration; National Water Quality Monitoring Council; Trust for Public Land; U.S. Census Bureau; U.S. Environmental Protection Agency; U.S. Geological Survey; and Your Economy. To find more information about the data and analyses used, please refer to the methods report.

Fred A. and Barbara M. Erb Family Foundation

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CLINTON RIVER WATERSHED COUNCIL

University of Maryland
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For more information visit MichiganReportCards.org