River Raisin

WATERSHED REPORT CARD

MICHIGAN'S RIVER RAISIN

The River Raisin (Riviere Aux Raisin, River of Grapes), known first as "Nameziibi" (River of Sturgeon) in the Ojibwe language, drains to the Western Lake Erie Basin. The watershed covers most of Lenawee County and smaller portions of Monroe, Washtenaw, Jackson, and Hillsdale counties in Michigan along with a piece of Fulton County in northeastern Ohio, a total of about 1,059 square miles. The northwestern headwaters mark the most easterly advance of ancient glacial ice sheets in southeastern Michigan. The Irish Hills area, a unique local high point in Hillsdale County, is the headwaters for the Raisin, Grand, Kalamazoo, St. Joseph, and Maumee rivers. The River Raisin watershed includes the traditional lands of the Pottawatomi, Odawa, and Wyandot nations.

River Raisin Watershed Council volunteers.

Industry in the form of mills throughout the watershed gave way to automobile manufacturing plants and eventually became home to some of the largest energy-generating plants in Michigan. The cost of doing business along the River Raisin resulted in some chronic pollution problems, but despite these challenges, the Raisin still has many beautiful natural wonders. The main stem of the river has some of the richest mussel beds in the state of Michigan. Forests, prairie fens, and remnant oak barrens support rare species such as the eastern massasauga rattlesnake, Blanchard's cricket frog, the Indiana bat, the spotted turtle, and the Karner Blue butterfly. These same upper watershed areas are also among the most significant inland migratory bird stopover areas in the Western Lake Erie Basin.

THE RIVER RAISIN WATERSHED COUNCIL

The River Raisin Watershed Council (RRWC) was formed in 1974 under the state of Michigan's Local River Management Act and is governed by a Board of Directors appointed by member municipalities. RRWC is a public service, non-profit, 501(c)(3) organization. The mission of RRWC is to inspire behaviors that promote stewardship, improve water quality, and encourage public participation to protect, preserve, and enhance the River Raisin Watershed.

The watershed council achieves these goals by working with partners on various activities, including classroom and public education, outreach to farmers, water quality monitoring, volunteer cleanups, and encouraging recreation on the river. Through these actions, the organization strives to promote and foster an understanding of the connection between our quality of life and the health and well-being of the watershed. To learn more about the vital work the RRWC does in the River Raisin watershed, visit RiverRaisin.org,

The members of the River Raisin Watershed Council. Photo courtesy of Meija Knafl.

THE LEGACY OF HYDROELECTRIC POWER

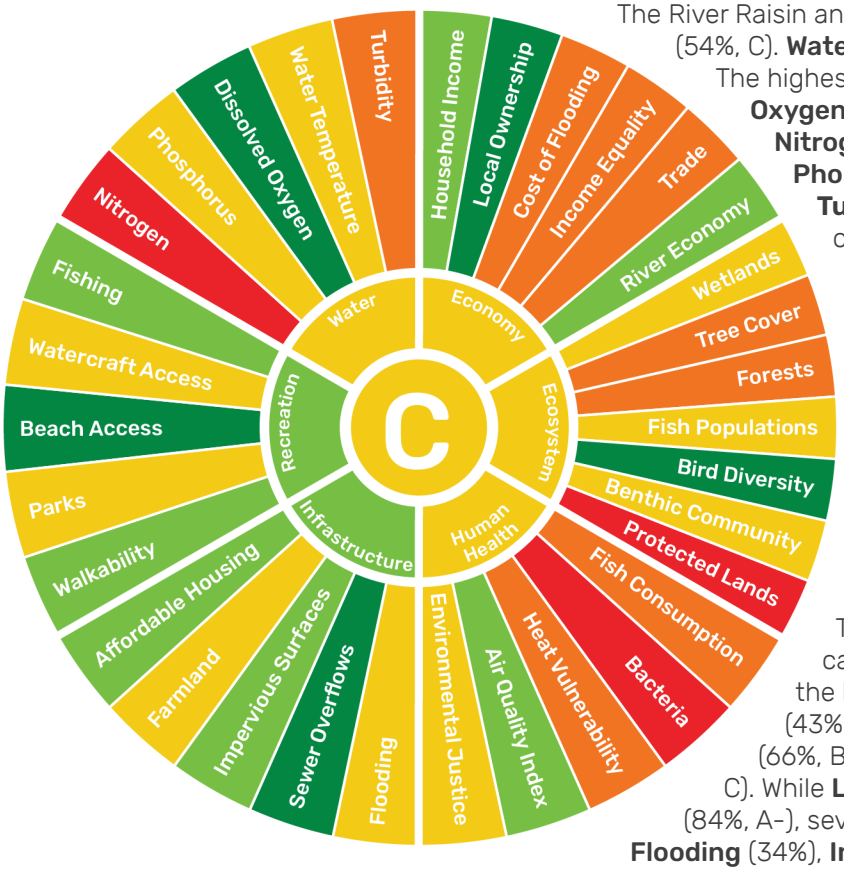
The power of the River Raisin was harnessed using dams during the twentieth century. Dams completely changed the river sediment balance. Dams disrupt the natural movement of water and sediment, acting as sediment traps on one side and a force for erosion on the other. The Brooklyn Dam is one of the few remaining dams on the Raisin. It was constructed in 1939 and was used to supply hydroelectricity for the adjacent manufacturing plant. However, this dam is no longer used to supply hydroelectric power, and the Department of Environment, Great Lakes, and Energy (EGLE) now classifies the dam as a High Hazard Potential Dam. A dam failure would cause severe impacts, including loss of life.

Demonstrating a buffer survey map of Brooklyn Dam.

The area around the dam is classified as high gradient habitat, a particularly diverse and valuable type of river habitat that comprises only 5% of the Raisin. Modification of the Brooklyn Dam and restoration of a functioning stable river channel, with replacement of the Mill Street Bridge and construction of natural rock rapids over Nooney Dam, will eliminate risk and liabilities associated with the dam, improve public safety, and restore habitat and resiliency in the river. The RRWC is leading this effort. Project activities will provide up to 44 miles of connectivity to headwater reaches of the River Raisin allowing for daily, seasonal, and annual fish movement to access habitat necessary to live out their lives. Certain mussel species, like the Rayed Bean, use fish as hosts to move upstream as juveniles.

Restoration improves recreational fishing. Photo by USFWS.

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



The River Raisin and its watershed are in moderate condition (54%, C). **Water** quality was in moderate condition (44%, C-). The highest-scoring water indicator was **Dissolved Oxygen** (85%, A), while the lowest-scoring indicator was **Nitrogen** (12%, F). **Water Temperature** (49%, C) and **Phosphorus** (53%) received moderate scores, while **Turbidity** (21%) received a poor score. **Ecosystem** condition in the River Raisin was moderate (47%, C). **Ecosystem** scores ranged from very poor (**Protected Lands**, 12%) to very good (**Bird Diversity**, 90%).

Human Health was in moderate condition (44%, C-), with scores ranging from very poor (**Bacteria**, 17%) to good (**Air Quality**, 75%). **Infrastructure** condition in the River Raisin is good (69%, B). Scores in this category ranged from moderate (**Farmland**, 49%) to very good (**Sewer Overflows**, 94%).

The highest-scoring indicator in the **Recreation** category was **Beach Access** (100%, A+), while the lowest-scoring indicator is **Watercraft Access** (43%, C-). Overall, **Recreation** was in good condition (66%, B). The **Economic** condition was moderate (52%, C). While **Local Ownership** received a very good score (84%, A-), several indicators received poor scores: **Cost of Flooding** (34%), **Income Equality** (26%), and **Trade** (22%).

Grade Scale

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

PRODUCTIVE AND **HEALTHY** LANDSCAPES

The River Raisin watershed is a major producer of corn and soybeans in the state of Michigan. Over 75% of the watershed is in agricultural production. But the River Raisin is caught in the middle of the great dilemma of modern, industrialized agriculture: balancing production with environmental stewardship. Nutrients from agricultural lands are washed into the river by storms and floods. The RRWC works hard to support farmer leaders who promote sustainable practices, benefiting the farmer and water quality alike.

One of Michigan's water quality objectives is to reduce phosphorus entering Lake Erie by 40% by 2025, and in order to achieve that, we must increase adoption of conservation practices within the basin. The Michigan Agriculture Environmental Assurance Program (MAEAP) is a free program that helps farms adopt practices that minimize agricultural pollution risks. Of the estimated 1 million acres of cropland in Michigan's part of the Western Lake Erie Basin, approximately 15% are now MAEAP verified.

Corn growing in a field. Photo by UMCES IAN.

Farmer-led initiatives have been able to foster conversation and interest within the farming community, resulting in expanded understanding of the environmental issues and the need for the adoption of conservation practices. It is essential to build more understanding, support, and engagement with farmers within the basin to protect Michigan's farmers, land, and water.

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 River Raisin 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 River Raisin, there are fifteen Sanitary Sewers that were assessed, and no Combined Sewers. **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.

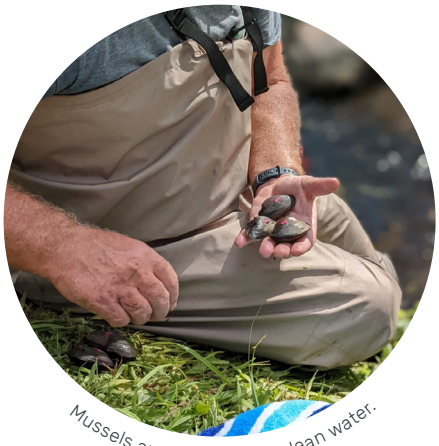
RIVER RAISIN **AREA OF CONCERN**

The lower 2.6 miles of the River Raisin has been identified as one of Michigan's fourteen Areas of Concern (AOC). Historical discharges of heavy metals and polychlorinated biphenyls (PCBs) from industry caused degradation over many years. Projects to restore the AOC included work to reduce erosion to an island, restoring marsh and prairie habitat, removing invasive plant species, enhancing fish passage to the river, and removing contamination from the food chain. These projects have provided habitat for fish, waterfowl, turtles, and other wildlife.

THE **FUTURE** OF THE RIVER RAISIN

The River Raisin Watershed Council will celebrate 50 years of dedication to the river in 2024. Though the future will undoubtedly hold nearly as many twists and turns as the River Raisin itself, there will always be those who love the river and work hard to keep its waters clean and healthy. With the help of our residents and partners across the watershed, the future of the River Raisin is clear and bright.

Do you want to get involved in protecting the future of the River Raisin? Join us for an Adopt-A-Stream event to survey bugs living in the river, or participate in our Rescue River Cleanup Program to remove trash and invasive species. For educators, we offer classroom programs and field trips to help you teach about wetlands, migratory birds, and more! An annual poster contest is open for students pre-K through 12th grade to make art inspiring education and protection of our local river! Check out these and other programs at www.riverraisin.org.



Mussels and clams need clean water.

A Karner Blue butterfly. Photo by USFWS.

RRWC volunteer surveying benthics.

ACKNOWLEDGMENTS

This report card is a timely, transparent assessment of the River Raisin and its watershed, which is the traditional lands of the Pottawatomi, Odawa, and Wyandot peoples. This document was produced by the River Raisin 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 River Raisin Watershed Council unless otherwise specified.

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; 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; River Raisin Watershed 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

River Raisin WATERSHED COUNCIL
Partner · Protect · Preserve

University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE
INTEGRATION AND APPLICATION NETWORK

For more information visit MichiganReportCards.org