THE MUSKEGON

The Majesty and Tragedy of Michigan's Rarest River

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Michigan State University Press • *East Lansing*

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Michigan State University Press
East Lansing, Michigan 48823-5245
www.msupress.msu.edu

Printed and bound in the United States of America.

12 11 10 09 08 07 06 1 2 3 4 5 6 7 8 9 10

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA
Alexander, Jeff, 1962–
The Muskegon : the majesty and tragedy of Michigan's rarest river / Jeff Alexander.
p. cm.
Includes bibliographical references and index.
ISBN-13: 978-0-87013-786-0 (pbk. : alk. paper)
ISBN-10: 0-87013-786-7 (pbk. : alk. paper)
1. Muskegon River (Mich.)—History. 2. Natural history—Michigan—Muskegon River. 3. Muskegon River (Mich.)—Description and travel. 4. Muskegon River (Mich.)—Environmental conditions. 5. Stream conservation—Michigan—Muskegon River. I. Title.
F572.M93A44 2006
977.4'5—dc22
2006021613

Cover design by Heather Truelove Aiston
Book design by Sharp Des!gns, Inc., Lansing, Michigan

Cover photo: An aerial view of Croton Dam, which divides the lower Muskegon River from the upper 172 miles of the river and its major tributary, the Little Muskegon River (upper right). (Photo by Marge Beaver, photography-plus.com.)

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To Jessica, Kelsey, and Eric
for making our river journeys memorable.

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ACKNOWLEDGMENTS

I could not have written this book without the many people who share my passion for the Muskegon River or who helped me overcome the personal challenges associated with writing a manuscript of this length. Words do not fully reflect my appreciation for the support I received from the Wege Foundation and the Great Lakes Fishery Trust. Specifically, Peter Wege and Jack Bails have earned my lasting gratitude and respect for their ambitious and incredibly generous support for efforts to restore and preserve the Muskegon. Peter Wege's assistant, Terri McCarthy, provided valuable counsel when I questioned my ability to complete this book. Gale Nobes spent countless hours of his free time over the past few years showing me various aspects of the Muskegon River system and explaining the finer points of river ecology. I am indebted to countless others who provided me with information about the river and helped me understand how human activities have affected this ecological gem. When it came to writing the manuscript and getting it published, Dave Dempsey served as a mentor. Susan Harrison Wolffis, a colleague and writer whose work I've long admired, read the manuscript and was always a source of encouragement. Most importantly, I must acknowledge the patience and loving support of my wife, Martha, who has stood by me in good times and bad. She is my rock.

TIMELINE OF MUSKEGON RIVER HISTORY

18,000 B.C.E.	The glaciers slowly began to melt.
8,000–6,000 B.C.E.	The last ice sheets over the Great Lakes melted. Native Americans migrated to the region from Asia. The Muskegon River began to take shape as the glaciers receded.
1634	French explorer Jean Nicolet visited the mouth of the Muskegon River. He was believed to be the first non-Indian to visit the area.
1734	Odawa Indians established their first village along the Muskegon River, near where the river flows into Lake Michigan.
1812	Frenchman Jean Baptiste Recollet opened a fur trading post on Muskegon Lake. Fur trading dominated the Great Lakes economy until the 1830s, when the beaver populations were depleted.
1836	The Treaty of Washington, in which Native American tribes sold millions of acres of Michigan land to the

federal government for pennies per acre, sparked a land rush in West Michigan.

1837 The first lumber mill on the Muskegon River, the Penoyer Mill, began operating in Newaygo.

1838 The first lumber mill on Muskegon Lake opened and the first of seventy-three annual log runs took place on the Muskegon River.

1854 The first dam built across the Muskegon River was completed in Newaygo. The dam powered the Big Red Mill, the largest sawmill in Michigan at the time.

1855 The arctic grayling, considered Michigan's most spectacular game fish, was discovered in the Hersey River, a tributary of the Muskegon River. By 1905, the grayling was eliminated from the Muskegon River system, the victim of excessive fishing, logging and the construction of dams.

1887 Logging peaked in the lower Muskegon River basin. Lumber mills on Muskegon Lake cut 661 million board feet of lumber and 520 million shingles in one year.

1905 The last major log run on the Muskegon River.

1906 Rogers Dam was built near Big Rapids.

1907 Croton Dam was built near Newaygo.

1910 The last lumber mill on Muskegon Lake closed.

1931 Hardy Dam was built between Croton and Rogers dams.

1964 The U.S. 31 bridge over the Muskegon River marsh near Muskegon opened to vehicles. The bridge was built atop a levee that dammed much of the marsh.

1967 Chinook salmon were planted in Lake Michigan to reduce alewife population. The Muskegon River eventually became Michigan's most productive salmon stream.

1969 The Newaygo Dam was removed.

1973 The Muskegon County Wastewater Management System was completed, cleaning up the water in Muskegon Lake.

1975 Muskegon residents rallied against a proposed North Star Steel plant, and the firm decided to build elsewhere.

1986 The Muskegon River's worst flood in recorded history nearly burst the Hardy and Croton dams. The flood increased the flow of the river to ten times the normal rate and deposited a thick layer of sand in the Muskegon River marsh near Muskegon.

1994 Federal operating licenses were renewed through 2034 for the Croton, Hardy, and Rogers hydroelectric dams. The license required Consumers Energy to mimic the river's natural flow downstream of Croton Dam, a change that contributed to the creation of a nationally recognized trout fishery in the lower river.

1997 A state study of the Muskegon River concluded that it had been fundamentally altered and harmed by human activities over the past 160 years but was capable of a dramatic recovery.

1998 Muskegon River Watershed Assembly formed to preserve, protect, and restore the Muskegon River system.

2000 The Muskegon River Watershed Partnership formed and launched scientific studies aimed at restoring and preserving the river in the face of increasing land development. The Great Lakes Fishery Trust contributed $5.5 million to the river restoration effort; the Wege Foundation contributed another $2 million.

2001 The remnants of the Big Rapids dam were removed.

2001 The state of Michigan approved Nestlé North America's $150 million water bottling plant in Mecosta County. The company was permitted to pump 210 million gallons of groundwater out of the Muskegon River watershed annually and sell it as Ice Mountain Natural Spring Water.

2003 Scientists warned that lake sturgeon, the largest fish in the Great Lakes, was on the verge of being eliminated from the Muskegon River.

2003 After opponents of the Nestlé project filed a lawsuit claiming that the Ice Mountain facility would harm nearby lakes, streams, Judge Lawrence Root ordered Nestlé to turn off its spring water wells. Nestlé appealed the ruling and was allowed to continue pumping groundwater at 50 percent of the plant's capacity until the case is settled.

2004 Scientists studying the Muskegon conclude it is one of Michigan's most biologically productive rivers. They warned that poorly managed land development, which contributed to urban sprawl, posed the greatest threat to the river's fragile ecosystem.

PROLOGUE

FATAL ATTRACTON

My old friend, the Michigan grayling: I shall never again see you or your equal.

—George Alexander, sportsman, circa 1930

Dusk was rapidly descending in the Muskegon River valley as two fishermen raced upstream in a jet-powered boat, desperate to make a few more casts before it was too dark to distinguish between the river and the coal-colored sky. The high-pitched whine of the motor could be heard long before the boat came into view. A half mile upstream, Paul Vecsei feared the worst. The University of Georgia fish biologist with the Hungarian accent knew that the noisy boat would likely dash any chance of seeing a lake sturgeon—an ancient fish that could grow to eight feet long, weigh as much as two hundred pounds, and looked like a cross between a shark and a catfish. A native, sentinel species that lived for thousands of years in the Great Lakes and the rivers that flow into these inland seas, the sturgeon symbolized the Muskegon River's majesty and tragedy.

On a cool spring evening in May, Vecsei patrolled one of the most popular and healthiest stretches of the river, a fourteen-mile section below historic Croton Dam. With the aid of electronic telemetry, Vecsei was trying to find one of the sturgeon he fitted months earlier with a tracking device. He guided his pale green fishing boat down the river's tea-colored

water, heading for a pool in the river that served as a sturgeon love shack. Passing over sunken pine logs—remnants of a nineteenth-century logging frenzy that laid waste to Michigan's forests and turned rivers into conveyor belts for pine logs—Vecsei frequently interrupted his impromptu science lesson with vitriolic tirades about fast, noisy jet boats that he believed could drive the last few sturgeon from the Muskegon River.

Rounding a bend, Vecsei spotted Boathouse Riffle, a stretch of clear water in an area of the river too wide to throw a stone across. Suddenly, a low-pitched beep burst from the electronic tracking equipment. "Did you hear that?" Vecsei asked his passenger. Then another beep, followed by a third. He quickly wheeled the boat around, heading back upstream to the spot where he heard the first indication that a sturgeon was nearby. He headed toward a deep spot along the bank, a place where these massive fish hid in the opaque water. By then the tracking equipment was chattering like a treed squirrel taunting a dog. It told Vecsei that one of the sturgeon he tagged earlier in the year—Fish 744, a large male lake sturgeon, *Acipenser fulvescens,* about twenty-five years old and weighing thirty-one pounds—was lurking beneath the boat. "There's a sturgeon down there. He's hiding. These fish aren't stupid," Vecsei said. Indeed. The fish stayed out of sight.

Knowing that the fish would not surface with a boat nearby, Vecsei headed back downstream to Boathouse Riffle, an area where sturgeon often spawn in the spring, before the water temperature was too warm to nourish their eggs. Nearing the rippling waters of Boathouse Riffle, Vecsei cut the motor, and the boat drifted with the current. He studied the water like a dog on point, examining areas where spawning sturgeon deposited hundreds of thousands of sticky eggs in a blanket of gravel on the bottom. Just then, the jet boat heading upstream roared around the bend, leaving a trail of noxious fumes and a wake large enough to dislodge incubating sturgeon eggs and send adult fish fleeing for cover. Vecsei was livid. "Damn jet boat," he yelled, shaking his fist above his head. He would see no sturgeon that day. The fishermen were oblivious to Vecsei's rage; they respond to his raised fist with a friendly wave.[1]

Prior to 1835, when tens of thousands of European immigrants began streaming into Michigan to settle what was then wilderness occupied by small bands of Indians, sturgeon ruled the Great Lakes and large rivers that empty into these freshwater seas. Scientists estimated that 11 million

sturgeon lived in Lake Michigan alone in the 1800s. At that time, thousands of sturgeon—possibly 10,000 or more—likely migrated up the Muskegon River each spring to spawn before returning to Lake Michigan.[2] That was before logging transformed the Muskegon into a working river used to transport millions of logs, and dams built to power sawmills and generate electricity, obliterated fish spawning beds and restricted their upstream migration.

According to a 1991 Ferris State University study, "Human activities over the years have greatly influenced the characteristics of the river. Construction of dams, logging, industrial practices, agricultural practices and recreational activities all have combined to alter the river's natural characteristics."[3] For more than a century, sturgeon that migrated up the Muskegon River to spawn have been limited to the lower 47 miles of the river; since the 1850s, dams built in and near Newaygo have blocked sturgeon from reaching 172 miles of river upstream of the dams.

In the mid-1800s, European immigrants slaughtered sturgeon because the huge fish, which are covered with bony plates, tore fishing nets when hauled in from Lake Michigan with the more desirable whitefish and lake trout. In the late 1800s, smoked lake sturgeon and caviar became a delicacy, and the fish, which have inhabited the world's oceans, lakes, and rivers for 135 million years, since long before the dinosaurs vanished, were driven to the brink of extinction in the Great Lakes basin.

There were between one thousand and three thousand sturgeon in Lake Michigan in 2000, and between thirty and one hundred adult sturgeon in the "Muskegon stock," fish that spawned exclusively in this river.[4] Biologists said that a minimum of five hundred sturgeon must remain in the Muskegon River stock to maintain a viable population. Without human intervention in the form of a fish rearing and stocking program, the Muskegon's sturgeon population appeared destined for extinction, much like the majestic Arctic grayling that once inhabited parts of this magnificent, manipulated river.

COLD, CLEAR WATER FLOWED UNDER THE LOG WHERE THE NATIVE AMERican man lay still, his face close to the creek, fish spear at the ready. His prey would soon come into view: a silver fish eighteen inches long with a purple

streak and a freakishly large dorsal fin; it moved gracefully through the shallow stream that spilled into the Muskegon River's midsection, making easy pickings for the skilled fisherman.

Before long, the Indian and his fellow anglers speared thirty of the fish, much to the delight of John T. Elliott. A businessman by trade, Elliott had ventured into what was then wilderness near Big Rapids with a group of Indian men to capture and identify a spectacular fish that was causing a stir among Michigan anglers.[5] It was 1861 and the brutal U.S. Civil War had just begun. But in the wilderness of northern Michigan, much of the talk was about a beautiful, delectable fish found in huge quantities in northern Michigan rivers, including the Muskegon.

Elliott had gone searching for the fish at the urging of J. C. Parker, a fellow Grand Rapids businessman who later served on the Board of Michigan Fish Commissioners. The fish Elliott secured in June 1861 would later be identified as Arctic grayling, *Thymallus articus*. The Arctic grayling was special because it was native to Michigan. A glacial relic that settled in Michigan as the last Ice Age ended, the Arctic grayling captured the attention of anglers and naturalists in the last half of the nineteenth century. And why not? The mere existence of grayling in Michigan was nothing short of miraculous.

Like the sturgeon, grayling migrated to Michigan as the glaciers that created the Great Lakes completed their retreat about eight thousand years ago. As the glaciers melted, schools of Arctic grayling moved into Michigan's coldest streams; the fish flourished for centuries in northern Michigan rivers, which were pristine, cold and had gravel beds ideal for spawning. That was before European immigrants began arriving in Michigan in large numbers in the mid-1800s.

The settlement of Michigan would bring about several ecological disasters, one of which involved the grayling. Within eighty years of its discovery, the grayling was eliminated from all Michigan waters. It was the victim of human-induced changes to the landscape, and a frontier mentality that held that natural resources were inexhaustible.

Michigan's love affair with the grayling was intense and short-lived—a veritable one-night stand on the geologic clock. By 1905, fifty years after it was first documented in the Hersey River, the Arctic grayling was eliminated from the Muskegon River system. In 1936, the state declared Arctic grayling absent from all Michigan lakes and streams. Many factors—

logging, the construction of dams, and the introduction of brook trout (now Michigan's state fish), an exotic species that competed with the grayling for food and habitat—contributed to its demise.

Soon after it was discovered, the grayling became the most coveted sport fish in Michigan. Anglers flocked to tributaries of the upper Muskegon and other cold-water rivers in northern Michigan to catch a fish that was colorful, graceful, and tasty. Michigan's fascination with the grayling was documented in 1880 by Grand Rapids writer Martin Metcalf, who noted that reports had begun to circulate in 1855 of a "new and peculiar kind of brook trout that was being caught in certain tributaries of the Muskegon River."[6]

In an 1889 essay, J. C. Parker told of anglers catching "vast numbers" of grayling in Hersey Creek, a cold-water stream that flows into the Muskegon a few miles north of the city of Big Rapids. "These fishes were slaughtered by the thousand, and no less than a half-dozen wagon loads were hauled away."[7] Similar reports came out of the Au Sable and other northern Michigan rivers, where grayling catches were so numerous that piles of fish were sometimes left to rot on river banks.

For all its beauty, the grayling had a fatal flaw: Because grayling were surface feeders that were easy to spot, the species was annihilated by anglers before the advent of catch limits. By the 1880s, the grayling had come under siege by scores of anglers eager to sample the unusual fish. At the same time, logging in the Muskegon River basin was approaching its peak. Hundreds of thousands of giant pine logs were rolled into the river each spring and floated downstream to sawmills in Big Rapids, Newaygo, and Muskegon; these runs took place at the same time grayling were attempting to spawn in gravel beds on the river bottom. These fragile fish were no match for the ravages of logging: during the spring run, when it was possible to walk across the Muskegon, huge logs clogged the river and scoured its bottom, wiping away fish spawning beds. Spawning areas that were not decimated by massive logjams often were suffocated by tons of sand that washed into the river from eroded stream banks laid bare when logs were rolled into the river.

Metcalf was one of a handful of Michigan conservationists who began to warn in the late 1800s of the grayling's demise. He concluded that grayling could not compete with increasing numbers of brook trout or cope with the harm logging caused to rivers:

> The grayling is fast disappearing from Michigan waters and will, together with his gamy and beautiful kinsman, at no very distant day be remembered with the things that were and are not, unless some effectual bar shall be erected [to prevent] against the indiscriminate slaughter of the innocent and universal use of our most superb fish breeding grounds as deposits for the dust of sawmills and sewers for everything that is vile under the sun.[8]

Many factors contributed to the annihilation of grayling in Michigan waters, all of them caused by human hands. A small number of the fish survived until the 1930s—after logging had ceased and despite the presence of other species of trout—in the Otter River in the Upper Peninsula. That anomaly led Wayne Creaser, a Wayne State University scientist, to suggest that rising water temperatures as a result of the clearing of forests that increased exposure to sunlight and sediment that washed into rivers during logging operations could have played a role in the elimination of grayling. Grayling are more temperature sensitive than most species of fish, including brook trout.[9]

The popularity of grayling prompted efforts to expand its range long before the fish was thought to be in danger of becoming extinct in Michigan. In 1877, adult grayling were transferred from the Manistee River to one lake and three streams in southern Michigan. Similar stocking efforts took place in 1880 and again in 1925. All failed.[10]

As it became clear that grayling were disappearing from many rivers, the state of Michigan stepped up its fish stocking program. Between 1900 and 1930, more than 3.3 million grayling taken from Montana waters were released in Michigan rivers and lakes, most of which were located in areas where grayling were abundant in the 1870s. The Michigan Department of Natural Resources continued its efforts to reestablish grayling in Michigan waters until 1991, to no avail. Many grayling planted in Michigan rivers were eaten by other fish; some died of disease in hatcheries. The bottom line: Arctic grayling have been unable to survive and reproduce in Michigan waters since 1936. "It's a pretty sad story,'" said Andrew Nuhfer, a research biologist with the Michigan DNR.

Although Michigan's rivers were no longer used to transport logs, Nuhfer's 1991 study of the Arctic grayling concluded that the proliferation of dams in Michigan rivers during the early 1900s created a new set of

environmental conditions that grayling could not overcome. "Arctic grayling are unlikely to either survive well or reproduce in contemporary Michigan rivers," Nuhfer said in a 1999 interview. "They seem to need large, cold, non-fragmented rivers with few competing fish species, particularly salmonids. Perhaps future river restoration efforts, such as dam removal, will provide some large-river habitats that will better support grayling survival and reproduction."[11] The elimination of Arctic grayling from the Muskegon is a cautionary tale in danger of being repeated. It is evidence that human actions can cause permanent, devastating changes to natural systems.

Losing the Muskegon River's dwindling sturgeon population would constitute another blow to a severely altered ecosystem and represent, biologically and symbolically, a huge setback in efforts to restore the sprawling river system. As the river went, so went the sturgeon. If attempts to restore and preserve the Muskegon succeeded, sturgeon could (with human assistance) stage a dramatic comeback. But if increased pollution, more exotic species, and less fish habitat plunged the river into ecological chaos, the dwindling sturgeon population would be one of the first casualties.

With the Arctic grayling a distant memory, the Muskegon River's new indicator species—canaries in the coal mine, if you will—were sturgeon, trout, salmon, and walleye. Fish provided just one measure of ecosystem health, but they represented an important, tangible indicator. Sick, polluted rivers could not support healthy fish populations. If the Muskegon became too polluted or choked by sand and silt washing off the landscape, the few remaining sturgeon would vanish. If the river's cool water became too warm, the nationally recognized trout fishery below Croton Dam would disappear. Such changes could have profound effects on the river ecosystem and the economies of Muskegon and Newaygo, where people who come to fish in the river spent millions of dollars each year on fishing gear, food, and hotel rooms.

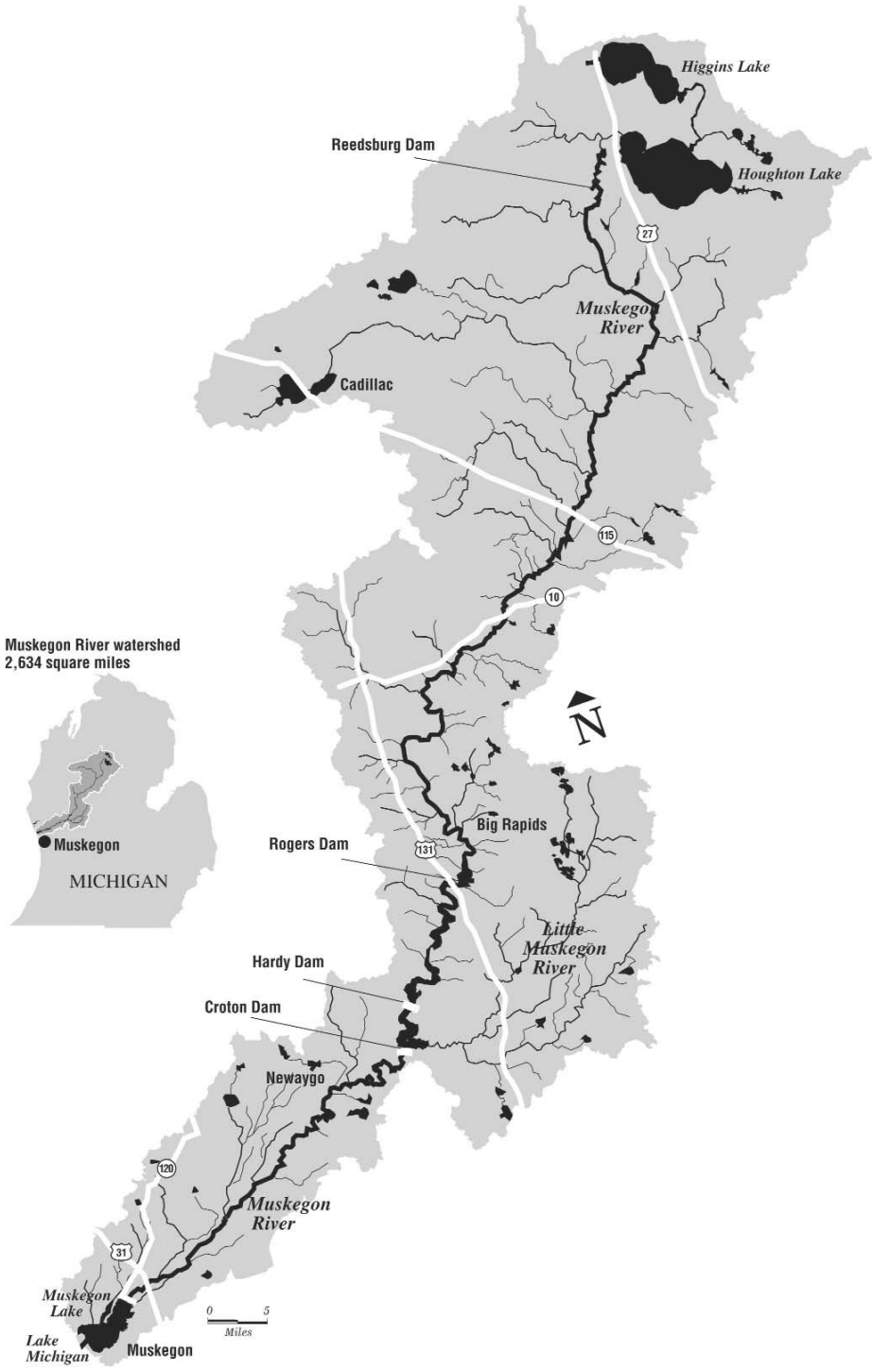
The Muskegon River faced myriad serious environmental challenges at the end of the twentieth century. Still, there were reasons to be optimistic about its future. In the late 1990s, nearly a century after grayling were eliminated, efforts by the state to create a trout fishery below Croton Dam began to pay off. As was the case with grayling, the health of the trout fishery was the result of human activities. Removal of the Newaygo Dam in

1969, followed by operational changes at Croton Dam in 1994 that restored the river's natural flow downstream and a government-run trout stocking program, created the nationally recognized trout fishery.

In the mid 1990s, anglers from across the United States and parts of Europe and Asia began to converge on a stretch of river near the small town of Newaygo to fish for steelhead and salmon. The Muskegon River below Croton Dam soon became known as one of the nation's finest trout fisheries downstream of a dam.

History has shown that humans possess the ability to harness, control, and harm this mighty river; we also possess the scientific knowledge and technology to restore some of its greatest natural features. How will future generations know if early-twenty-first-century efforts to restore the Muskegon's tattered ecosystem succeeded? The answers will be swimming in the river.

THE MUSKEGON


Higgins Lake
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Muskegon River watershed
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