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The Upper Great Lakes are beautiful in their enormity, clarity, and beauty. But their appearance is not the whole story. Underneath the surface there is clear evidence of profound ecological change, exhibited in many ways but especially in the history of fish species. Fish are impacted by airborne pollution; over-fishing, point pollution, run-off pollutants and invasive species compete for food and alter the food chain.

The size and quality of native fish stocks provided a reliable food source for Native Americans and impressed the first European visitors to the Upper Peninsula. Fish, particularly whitefish, were a mainstay in the diet of Upper Peninsula's indigenous population. During the spring, summer, and fall they moved from the interior where they wintered, to the shores of Lakes Michigan, Superior, and Huron. Fish, meat, berries, and wild rice were Indian staples. In a few areas of the Upper Peninsula it was possible to plant a few hardy crops, but this was not a reliable source of food.

Father Claude Dablon, Jesuit Priest and Missionary in the Upper Peninsula, wrote his annual report in 1670 in which he described Indian fishing along the U.P. coast. Indian people fished from spring until winter for whitefish and he observed, ". . . it furnishes food for the greater number of these people. They net six or seven at a time."[1] "It is almost everywhere so abundant in sturgeon, whitefish, trout, carp, and herring. In one night fisherman catch twenty large sturgeon, or one hundred and fifty whitefish or eight hundred herring in one net. At the Ontonagon River they catch a lot of sturgeon day and night from spring through fall."[2]

Most Europeans commented on the plethora of fish, their high quality and their delicious taste. Henry Schoolcraft traveled through the Straits of Mackinac in 1820. He paused his narrative to comment on the fish. "Few persons have visited this island without being struck with the variety and delicacy of the fish, which are caught in the vicinity. Among them we see two species of trout, the lake herring, black and white bass, sturgeon, Mosquenonge, (muskellunge), white fish (ticamang of the Indians) pike, gar, perch, and catfish with several other species of cartilaginous and shell fish."[3]

Native people fished for subsistence. They fished with spears, gaffs, cast nets, and hooks fashioned of bone or later of metal obtained from Europeans. When Indians fished in the St. Mary's river and in other locations they used birch bark canoes and threw cast nets. Father Dablon described it this way:

> "Dexterity and strength are needed for this kind of fishing; for one must stand upright in a bark canoe, and there, among the whirlpools, with muscles tense, thrust deep into the water a rod, at the end of which is fastened a knot made in the form of a pocket, into which the fish are made to enter. One must look for them as they glide between the Rocks, pursue them when they are seen; and, when they have been made to enter the net, raise them with a sudden strong pull into the canoe. This is repeated over and over again, six or seven large fish being taken each time, until a load of them is obtained. Not all persons are fitted for this fishing; and sometimes those are found who, by the exertion they are forced to make, overturn the Canoe, for want of possessing sufficient skill and experience. This convenience of having fish in such quantities that one has only to go and draw them out of the water, attracts the surrounding Nations to the spot during the summer. These people, being wanderers, without fields and without corn, and living for the most part only by fishing, find here the means to satisfy their wants; and at the same time we embrace the opportunity to instruct them and train them in Christianity during their sojourn [8] in this place."[4]

By the 1830s the fur trade played out because of changing fashions in Europe, depressing demand for beaver pelts exacerbated by the near extinction of fur bearing mammals in the Great Lakes Country. Visitors to the region had earlier noted the commercial possibilities of the abundant fishery. Henry Schoolcraft noted the prevalence of fish on his 1820 trip with Lewis

Cass. “Their abundance,” he noted, “may hereafter render them an important article in the commerce of the upper lakes.”[5]

The fish harvest was on. It took less than fifty years for the fish catch to peak and then begin a precipitous decline due to rapacious overfishing that became industrial in scale and thoroughly mechanized. As the fur trade died the dominant American Fur Company survived by switching from furs to fishing. In the 1830s the company established fishing operations in the Upper Peninsula. Chandler Gilman, an early tourist from New York, traveled to Pictured Rocks in the summer of 1835. In September he arrived at Sault Saint Marie and noted that the agent was not there because he was overseeing the development of fisheries.[6] In these early days of commercial fishing the catch was salted and packed in barrels for shipment. Barrel makers, or cooperages, were common in fishing villages.

The rapid growth of the fishery was influenced by multiple factors in the nineteenth century. The Erie Canal opened in 1825. It was a waterway to the Atlantic Ocean making it possible to ship salted fish from the Great Lakes to eastern cities and even to Europe. The canal also stimulated commerce and population growth in places like Detroit thereby stimulating demand for fish. Fish no longer supplied a local market. The demand for Great Lakes fish burgeoned.

The Welland Canal opened in 1833 bypassing Niagara Falls and providing access to the St. Lawrence River and Atlantic. The Sault Locks opened in 1855 making it possible for shipping to move from Lake Superior to the lower lakes without the arduous portage at the Sault. In the years following the Civil War, the region connected to the nation by rail, and sailing ships gave way to steam. Rapid transportation made it possible to ship fish fresh packed in ice harvested from lakes during the winter.

In 1887, Bela Hubbard a noted explorer of the Upper Lakes and Detroit resident, wrote of whitefish that "now this deer of the lakes — par excellence — is not only universally known, but is procurable cheaply, at all seasons, both fresh and salted, from the lakes to the Gulf, and from the Mississippi to Cape Cod. It has even overleaped these bounds, and is shipped direct to Liverpool."[7] But then he ominously noted, "The greed of trade outruns all sober precautions. And it is to be feared that the time is rapidly approaching when the inhabitants of our lakes and rivers, like the wild animals which were once so abundant and are now so few, will be in like manner exterminated, and this great industry of Michigan will cease to be remunerative."[8]

By 1885 fisherman worked on a huge scale using gill nets hauled by steam tugs to reel in enormous catches. A report on the Great Lakes fisheries in 1885 reported that "at first only a few were owned by each fisherman (gill nets), these being set from sailboats near the land, but gradually the quantity of netting has been increased, steamers have been gradually replacing the sail-boats at the principal fishery centers, and the nets have been set farther and farther from shore, until now the ends of those belonging to fisherman of opposite sides nearly meet in the center."[9]

Fish harvests continued to expand until 1890 when the harvest from American waters fell for the first time. Greater numbers of fisherman, more and bigger nets with smaller meshes, steam tugs and smaller fish were essential to maintain the harvest. Imagine steam-powered boats dragging huge gill nets that gradually scooped up everything. The trends continued with huge industrial operations using every method to increase harvests of a dwindling supply of fish.

The biggest and most egregious corporate monopolist to dominate and destroy the Great Lakes fisheries was A. Booth and Company based in Chicago. In the 1880s the company built freezer plants in Escanaba and then Manistique and ran steam collection vessels from the plants to Chicago. They controlled the processing and marketing of Lake Michigan fish from the Straits to Green Bay and out to the Beaver and Manitou Islands. In the 1890s they did the same in Lake Superior. Booth controlled the business and set the prices paid for fish. Faced with declining harvests and in search of greater profits they netted fish of smaller and smaller sizes.[10]

Indiscriminate fishing techniques too, contributed to the collapse of the fishery. Gill nets trapped every fish of every species too large to fit through the mesh. Fish drowned and decayed in the nets before they were lifted and sometimes nets escaped their moorings and sank while the fish decayed thus fouling the water. In 1879 more than three thousand nets were lost at the entrance to Green Bay and over a half million whitefish died and decayed. The whole mess settled on customary spawning beds with long lasting impacts on fishing in the area.[11]

But it was not just overfishing that decimated Great Lakes' fish. The re-plumbing of the Great Lakes began with the Erie Canal in 1825 and culminated with the opening of the St. Lawrence Seaway in 1959. For the first time the Great Lakes were open to the passage of ships from anywhere in the world, and invasive species like sea lamprey and hundreds of other hitch hikers who made their way into the lakes with devastating results.

How and when sea lamprey infested the lower lakes is debatable but the invasion of the upper lakes happened in the 1930s with calamitous impacts. Fish, already decimated by overfishing and environmental pollution, perished to the point of extinction as the predatory lampreys literally sucked the life out of them.

But lampreys were only the first wave of an onslaught of invasive species that introduced alewives, smelt, domestic carp, zebra mussels, round gobies, and quagga mussels to name only the most obvious of hundreds of non-native species of all kinds that either swam, were introduced by humans or hitched rides in ship ballast. They came to the lakes from near and far.

Quagga mussels, for example, come from watersheds in the Ukraine. They finished the job that began with over fishing. Invasive species competed directly with native fish for food, interfered with spawning or altered the food chain. Consequently the ecological balance of the Great Lakes fisheries is not stable.

As alewives and smelt over ran the lakes, humans introduced new species of predator fish to feed on the new arrivals and to supply a new quarry for the burgeoning sport fishing industry. Fish stocking began in the lakes in the nineteenth century, but beginning in the 1960s following the collapse of native fish populations, well-meaning biologists introduced Coho and Chinook salmon and Steelhead trout all native to the Pacific Ocean.[12] A sterile hybrid cross between a brook and lake trout called splake, were also stocked. While Lake Superior fisheries are currently stable, fish stocks in Lakes Michigan and Huron are not because the mussels, which disrupt the essential food chain, diminish food supplies. Because of colder water temperatures, Lake Superior is less hospitable to invasive species than the other lakes. For example, zebra and quagga mussels are not found in Lake Superior and round goby populations are limited to very small areas.

Despite the plummeting fish populations Michigan did not regulate fishing until 1929. The law established season closures, minimum sizes, and legal types of commercial fishing gear. Areas were designated as off-limits for fishing. However no limits were set on the number of licenses issued so thousands of commercial fisherman continued to fish the lakes. Our lakes were managed for the highest possible production of commercially valuable fish species. Ironically by the mid-1960s the top three species harvested were all invasive smelt, carp, and alewives. Meanwhile trout, sturgeon, herring, and whitefish populations collapsed. In 1968 a moratorium was placed on new commercial licenses and licenses that were not used lapsed. The number of commercial fishing licenses was dramatically reduced so that now only a few dozen remain.

In the early 1970s Michigan banned the use of gill nets and forced fisherman to switch to trap nets, which do not indiscriminately kill all fish that were caught. Native Americans brought suits that argued treaty rights guaranteed their right to fish without state interference. However agreement was reached with tribal authorities on annual quotas for harvesting of lake trout, whitefish, and chubs. Commercial fishing is now so tightly controlled that it is no longer the primary determinant of fish stocks. Now it is the presence of invasive species that forces fluctuations in fish populations.[13]

The sea lamprey infestation was beaten back with pesticides to kill larva in streams and physical barriers and traps to prevent adults from traveling upstream to spawn. Results have been effective enough to allow fish stock to rebound but lampreys still thrive; attack fish, and only vigilant efforts to control their populations will prevent a rebound. For example, in recent years, efforts have focused on Lakes Huron and Michigan, meanwhile lamprey population Lake Superior rose dramatically.[14] Commercial fisherman confirm that increasing numbers of fish are caught with the lamprey attached or bearing scars from lamprey.

There are ongoing international, national, and state efforts to control discharge of ballast water from ocean going ships. Most recent introductions of invasive species are a consequence of ocean going vessels that take on ballast water containing animals and plants from other parts of the world. Those vessels then discharge the ballast water in the Great Lakes.[15]

That is how the ubiquitous zebra and quagga mussels arrived in the Great Lakes. Where they have clogged water systems they are removed by a variety of means, but no successful eradication or controls system is yet in place. Meanwhile they have profoundly changed the ecosystems by disrupting the food chains. [16]

Asian Carp too are moving toward Lake Michigan. In June, 2017 an Asian Carp was found in the Calumet River nine miles from Lake Michigan near Chicago. This eight-pound carp had evaded the electric barriers in place to prevent their movement into the lake. These fish eat massive amounts of plankton and hence compete directly with native fish species such as walleye, perch, whitefish, and other species.

Other phenomena will impact fish populations in the Great Lakes. Global warming will favor those species that thrive in warmer water and it will reduce those that depend on lower temperatures.[17] Already Great Lakes ice coverage has dropped by seventy one percent, average temperatures have risen, frost-free days have increased and precipitation is up.

Air pollution, dumping of industrial waste and reduction of agricultural run-off has been reduced. Many of the most egregiously polluted sites have been cleaned up. In the Upper Peninsula cleanup efforts have focused on Torch Lake in the Keweenaw, Deer Lake near Ishpeming, and the Manistique River.[18]

The Great Lakes surrounding our beautiful peninsula are not as Claude Dablon described them in 1670. There are fewer fish; some such as sturgeon are now rare. And there are fish he never saw that either invaded or were intentionally introduced by humans. He would be incredulous at the notion that humans manage fisheries and that there are health advisories that limit the quantities of fish that may be safely eaten. Yet the lakes remain and the lakes define us. We are water people entranced by our freshwater surroundings that stretch farther than we can see. The lakes are not commodities. They are the stuff of beauty, poetry and the stories of our ancestors. We must make decisions that improve their health, preserve their beauty and bequeath them whole to our grandchildren.

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