

# **Should Chicago Restore the “Natural” Divide?**

Environmental History and Philosophy (ENV 5040)  
Green Mountain College

by  
April Galarza

December 11, 2012

**Forward:** As an environmental activist, a community journalist and communications manager for social justice and environmental organizations, I spend the majority of my time writing persuasively. However from the very minute this class began, I was asked to leave my fundamentalism at the proverbial door and do my best to look at the underlying philosophical

## Should Chicago Restore the “Natural” Divide?

and historical precedents that influence different worldviews, and thus differing opinions on environmental issues. As of such, I have learned more about how to think objectively, and how to consider the other parties’ point of view from this class than I have in my entire academic and professional careers thus far. In order to demonstrate how far I have come—and as a personal challenge I have decided to not take a side at all in the debate that I am presenting in this paper. I will do my best my to present both points of view truthfully, completely and in context of the philosophical and cultural subtext I am starting to see behind every opinion.

### **Introduction**

Chicago is a city that is seen as having triumphed over nature. Its namesake river was straightened, channeled and molded to suit the needs of inhabitants, even going so far as to change the direction of its current. The river is exemplary of Chicagoans’ relationship with nature. Libby Hill explains (2000), “Chicago owes its existence to the Chicago River, and the river owes its present form to Chicago. Had the convenient but capricious portage between Lake Michigan and the Des Plaines River not been such a short way up the river, so attractively,

## Should Chicago Restore the “Natural” Divide?

provocatively close, Chicago would never have developed into the nation’s transshipment point” (p.5).

Since European settlers first arrived in this region, they longed to have an uninterrupted waterway connecting Lake Michigan and the Mississippi River. Over a hundred years of engineering—building canals, channels, locks and the ultimate reversal of the flow of the Chicago River -- have culminated in today’s Chicago Waterway System (CAWS). This waterway, the sole connection between the Mississippi River and the Great Lakes, has become the battleground for a national debate—one that has the potential to result in the historic separation of the two watersheds.

The CAWS has proven to be as convenient for aquatic invasive species (AIS) as it is for boats. Asian Carp are the most predominant and infamous of the invaders. “Asian carp” is actually a generic name for three species of carp including bighead, silver and grass. The most pernicious, the bighead and silver carp can grow to up to 110 pounds and eat between 20-40% of their body weight each day, seriously impacting the food supply for native fish. A single bighead carp could produce over a million eggs per year (Alexander 2011, 345).

Now the Great Lakes Commission, a panel of scientific and technical experts, political leaders and stakeholders from Chicago, Northwest Indiana, and other areas of the Great Lakes region are suggesting a radical solution. They are recommending that permanent barriers be constructed at key points to prevent all invasive species from passing through the CAWS—effectively undoing the work of generations (Great Lakes Commission [GLC] 2012).

Proponents of the barrier say it is critical that we prevent the imminent invasion of the carp into the inland sea of the Great Lakes, where they will grow to unmanageable levels and

## Should Chicago Restore the “Natural” Divide?

seriously impact the ecosystem by consuming the nutrients native species depend on. They say that the fishing and water recreation industries will suffer tremendous losses. They point to DNA samples of carp collected closer and closer to the Lake Michigan shoreline.

Opponents of the barrier say threats of invasion are either alarmist and unlikely, or entirely inevitable because the CAWS is only one of many entry points for the carp. Some are doubtful as to whether the Great Lakes would prove to be a viable habitat for the carp. Overall the opponents question whether the vast financial impact of building the barriers to separate the watersheds and the losses incurred by interruptions to the shipping and other industries dependent on the flow of watercraft through the CAWS would be worth it.

The debate over the barrier is multi-faceted. The gravity of either course of action for the stakeholders is monumental. The very different points of view present at the bargaining table are a microcosm of humanity’s attempts to quantify and qualify its relationship with nature.

### **Brief History of the Asian Carp Invasion**

Ironically the fish were originally imported in response to concerns raised by the mother of the modern environmental movement, Rachel Carson. The publication of her book *Silent Spring* encouraged less toxic ways to control the algae that developed as a part of aquaculture. (Egan 2006, 5) Government agencies such as the Arkansas Game and Fish Commission and the National Environmental Protection Agency began experiments using the fish as weed controls, to clean up sewage and as a possible domesticated food source for a growing planetary population.

## Should Chicago Restore the “Natural” Divide?

As security wasn't a priority at the time, escapes into the wild happened on occasion. By 1981 silver and bighead carp were being spotted in the Mississippi River. Flooding in the 1990s exacerbated the problem allowing even more carp to spread north (Alexander 2011, 343). Now they have traveled over 1000 miles and are regularly caught in large quantities—25,000 pounds per day—in the Illinois and Ohio rivers (Egan 2006, 5).

### **Philosophy of those who support the barrier - Compositionists**

Those who support the installation of a barrier to separate the two watersheds thus restoring the “natural divide” could be said to be *Compositionists*. Compositionists believe strongly in the integrity of the composition of the ecological web. They value the entire system and its workings, maintaining that each part--whether it is a living organism or a non-living element is integral to the system and are not interchangeable. Proponents could also be said to be *Techno-skeptics* because they feel that Nature or God designed the system, and that humans and their technology are unlikely to be able to replicate the proper design through interventions.

AIS under a compositionist philosophy are considered a direct threat to the delicate balance each member plays in the ecosystem. As Hull puts it, “Natives are good because they define the whole, exotics are bad because they ruin the whole's integrity.” A replacement species is seen as unimaginable because we cannot foresee consequences nor know for sure if the new species could truly replace the old species in all manners (reproduction, sustenance, etc.)(Hull 2006, 44).

Nicole Rodriguez captures the compositionist point of view in her definition of invasive species in “The Asian Carp Threat to the Great Lakes: An Analysis of Alternatives for Preventing Asian Carp Migration”

## Should Chicago Restore the “Natural” Divide?

These invasive species are alien, have no natural predators in the United States, and often bring in diseases. With no population controls, once introduced, AIS quickly propagate and gain a foothold in their new ecosystem. Once an AIS population has established itself, it becomes entrenched in the ecosystem, forever altering the delicate, life-sustaining balance of that system. AIS often cause a ripple effect, not only crowding out native species, but destroying natural habitats. They can forever alter a waterway, changing what life it can sustain and destroying the livelihoods of people who depend on it. (Rodriguez 2011, 1)

### ***Compositionalists and the Ecosystem***

Proponents of the barrier coming from a compositionalist perspective likely feel a moral obligation to protect the ecosystem of the CAWs and the Great Lakes. An *ecosystem*, as defined by Arthur Tansley, is a collection of living and nonliving elements organized in a determinate way. It is dynamic system of interconnections that is not random but works to maintain the balance within the system. (ENV 5015 Lecture #10)

Environmentalists and scientists supporting the barrier have expressed deep concerns over the potential damage to the ecosystem wrought by the Asian Carp. Kevin Irons, a biologist with the Illinois Natural History Survey cites that in a study of a 80-mile section of the Illinois river, it was found that “the average weight for a 25-inch buffalo fish had dropped from over 12 pounds to less than 9 pounds in the last five years - a period of time that coincides with the invasion.” (Egans 2006, 12). He also noted that he and the other scientists found “4,100 adult

## Should Chicago Restore the “Natural” Divide?

silver carp per mile in a 66-mile stretch of the Illinois River north of Peoria, or roughly 13 tons of fish in a mile” (Lam 2006, 4).

Over 180 exotic species have already affected the Great Lake’s ecosystem, and proponents of the barrier worry that the carp could further damage what they perceive to be an already sick system. “Native species have been eliminated or so squeezed to the side that the entire system is now, in the words of renowned Canadian biologist Henry Regier, ‘stripped down to just a very simple and sad caricature’ of its former self” (Egan 2006 14).

For most of the 20th century the CAWS was too polluted to support most aquatic life, but better sewage treatment and river cleanup efforts have resulted in a revitalization of the habitat (Egan 2006, 17). Typical surveys in the 1970s in the North Branch would find only ten species of fish. In recent years over sixty fish species have been identified including large-mouth bass, yellow perch, and bluegill, along with a number of nonnative species. Beyond fish, frogs, crayfish and turtles are returning. The beaver population is growing, and an increasing number of birds have been spotted flying overhead (Kibel 2007, 74).

The pollution had been tantamount to a biological seal, and the cleanup enabled carp and other AIS to invade the CAWS. Growing along with the accumulation of flora and fauna is an appreciation for them by Chicagoans. The threat of their loss, after only having restored the ecosystem so recently undoubtedly weighs heavily on the minds of the proponents of the barrier.

### *Aesthetic and Intellectual Values*

Aesthetic and intellectual values are determined largely by our cultural and historical identifications with a place. "People associate deep aesthetic, spiritual, and moral values with

## Should Chicago Restore the “Natural” Divide?

native species. People are concerned with equity, believing natives have a longer and thus more authentic claim to exist in their habitat" (Hull, 48).

Proponents of the barrier say that their once-familiar waterways where they boat, fish and swim have become overrun by these fish. They are perceived by many to be ugly, slimy and undesirable. Added to this is the tendency of bigmouth and silver carp which are sometimes as large as 20 pounds to startle at the sound of motors and leap as high as 10 feet into the air pummeling unsuspecting boaters (Egan 2006, 2). A 2005 report from the Fish and Wildlife Service warns that the concussions, broken bones, bruising, black eyes and other injuries may become more prevalent if the carp are allowed to spread (Alexander, 343). The Great Lakes Region is home to more than 4 million recreational boats, about a third of the U.S. total. “Locals are parking their Jet Skis, deflating their inner tubes and adjusting to the notion that their kids will grow up on a changed and increasingly menacing river. Some will grow up without knowing the river at all.” (Egan 2006, 2)

Compositionalists seek to maintain what they perceive to be natural. But who is to say what is natural and what is not? Hull says "Typically what makes something natural or normal is that it was produced by evolutionary history rather than by human accident or engineering" (Hull 47). By that definition an indigenous species would be considered natural. Lodge and Shrader-Frchette support this assertion:

[Invasive species can lead to] the obliteration of regional differences in flora and fauna. A focus on total species diversity at the local scale, including nonindigenous species, ignores the basis of the fear of the Homogocene that is shared by many in society, not just environmentalists: the high value placed on the uniqueness of regional biota. (YEAR, 34)

## Should Chicago Restore the “Natural” Divide?

But according to Sagoff, this definition is a gross generalization because over time humanity has changed the composition of regional ecology.

Likewise, in many places one can hardly imagine the landscape without alien species. Virtually everything down on the farm is an exotic: of all crops, only sunflowers, cranberries, and Jerusalem artichokes evolved in North America. Corn, soybeans, wheat, and cotton have been imported from some other land. Cattle came from Europe. Rockfish—or striped bass as they are known outside Maryland—are native to the Bay but have been introduced up and down the Atlantic and Pacific coasts for sport and commercial fishing. More than 90 percent of all oysters sold in the world are produced by aquaculture, and almost the entire oyster industry on the West Coast is based on a species imported from Japan.

He goes on to say that that while many of the plants and animals we now hold in high regard were once aliens, many of the “worst nuisances” are native (Sagoff, 9).

### *Economic Values*

This category asks the question: is the AIS causing an amount of damage that equates to financial loss? If so does it make sense to intervene? Will the cost to intervene save you from the financial loss caused by the AIS? Opponents to the barrier system cite economic hardship as the primary motivation for their opinion. Proponents say that the upfront cost now will save money in the long run. If economics alone was the only decision factor the two sides would be at an impasse.

## Should Chicago Restore the “Natural” Divide?

The Army Corps of Engineers developed three varying levels of protection. The first includes only one barrier at a strategic “pinch point,” the others involve multiple barriers. Estimates for the cost of the system are between \$3 billion and \$9.5 billion depending on the level of protection. There are various estimates as to how much would be lost if the barriers were installed and interrupted the flow of ships, barges and recreational watercraft--the accepted figure among proponents is around \$70 million.

But according to those who support the barriers, the cost of inaction would be far steeper. Asian Carp and other AIS threaten the \$4.5 billion fishing industry (*Rodriguez, 29*), as well as a recreational industry of sports fishers and lakeside pleasure seekers which is estimated at \$7 billion per year (*Alexander 2012*). The current infestation of non-native species is already costing the Great Lakes region an estimated \$200 million annually.

The commission realizes that talks of spending during a tough economic climate is daunting for tax payers and policy makers but they plan to spread the costs over nearly 50 years and share the responsibility with various groups of stakeholders in Chicago and beyond. They estimate that the cost per a household would be between \$4-11 per a year. The report goes on to make comparisons between the cost of this project and other well know infrastructure improvements to help conceptualize what they perceive to be a minimal investments such as the Illinois Tollway Capital plan: projected to cost \$12 billion over 15 years and Boston’s Central Artery/Tunnel Project (the “Big Dig”): constructed over nearly a decade at a cost of approximately \$15 billion (GLC, 19).

In examining these arguments objectively, it seems that the financial damage projected to affect the fishing and recreation industries factor in the proponents’ point of view, but to a lesser degree.

## Should Chicago Restore the “Natural” Divide?

The fishing industry would be damaged because the traditional species caught by fishers could become scarce. From a functionalist point of view, you could question this logic. No matter which outcome occurs, there will be plenty of edible fish available for the catching. However this line of reasoning does not hold weight for a compositionalist.

### **Philosophy of those who do not support the barrier - Functionalists**

The opponents of the barrier can largely be associated with functionalist and mechanistic philosophy. They are less focused on the entire system, and are instead interested in maintaining the individual functions the system performs. For this group, this is especially true when referring to the functions that enable economic pursuits. They can also be said to be *techno-optimists* because they would rather take their chances with an electric barrier, or some other technology that blocks the flow of AIS but does not interrupt business as usual on the CAWS. Maintaining the ecological integrity of the system and perceived “threat” of the Asian Carp are secondary in their estimation to economics.

Because this group is highly focused on the economics, they have a hard time relating with the opposing point of view whose economic argument in the eyes of a functionalist is weak. They might ask: how would an influx of fish damage the fishing industry? Couldn't we just switch out the product?

At most, ecologists may argue that new arrivals compete with those species that are already there, but they cannot tell us why competition of this sort is ecologically a bad thing. In economic life, competition is regarded as a good thing—even if Toyota sells a lot of cars in America. (Sagoff, 8)

## Should Chicago Restore the “Natural” Divide?

Hull explains how the acceptance of interchangeability of a functionalist overlaps with a mechanistic point of view, “The parts can be exchanged as long as the critical processes remain. For example some species could be viewed as redundant because other species perform the same ecological function.”

He cites the example of exotic oysters in the Chesapeake Bay, “From a mechanistic or functionalist perspective, it does not matter whether the filtration function is performed by the native oyster, a robust exotic oyster being considered for introduction, or some human-built filtration system” (Hull, 46).

### ***Protecting the Free Market Economy***

For this group, economics, the integrity of the free market system, industry and capitalism are of utmost importance. They have doubts whether the carp will prove to be as great of a threat as the proponents of the barrier are warning or they feel that preventing the migration of Asian carp is a lost cause because there are too many other points of entry besides the CAWS and the financial investment and potential damage to the fiscal solvency of the shipping, recreation and other river related industries would not be worth it.

Scientists studying the spread of Asian carp disagree on several points that affect this decision making process. Some doubt whether the Great Lakes will prove to be a hospitable habitat for the carp.

Konrad Dabrowski, professor and director of aquaculture at Ohio State University believes temperatures in the lakes are too cold and that reproduction on the scale needed for the species to establish itself are unlikely. He says, “Temperatures are too chilly, and rivers are not

## Should Chicago Restore the “Natural” Divide?

long enough, fast enough or warm enough for spawning. In Lake Erie the carp might be able to grow for only six months of the year, and in chilly Lake Superior, just two months; once the water drops below 59 degrees, the fish will lose weight in colder months of the year because it's too cold for them to feed, and their sexual organs will atrophy (Lam 2006, 7).

Others feel that projections of ecological decimation are overblown. Duane Chapman, a U.S. Geological Survey scientist in Missouri and one of the nation's leading experts on the fish says that “Even in waters thick with carp, not every species has suffered. In the Missouri River, there's a big catfish population that hasn't declined.” Some anglers have even reported finding young carp in the stomachs of their catches, indicating that Asian carp could become a food source for catfish (Lam 2006, 5). Chapman predicts that some species will prevail despite the influx of carp such as largemouth and smallmouth bass, and others will likely suffer. He notes that in Germany the zander or pike perch, a type of walleye, nearly vanished after the Asian carp invaded. Walleye is prized fish for anglers in lakes Erie and St. Clair (Lam 2006, 8).

Finally, some scientists, Chapman included, believe that the threat isn't immediate and the carp spread will instead take place gradually over the course of decades and thus won't be nearly as devastating as anticipated by proponents of the barrier. “It's possible they may never reach high densities in the Great Lakes, he said. And it won't be an overnight thing -- it could take 30 or 40 years.” But he maintains healthy doubt citing the spread of the pink salmon, a saltwater fish accidentally dumped in a sewer in Thunder Bay, Ontario in the 1950s which has since established a small population in all five lakes (Lam 2006, 7).

From an economic and therefore functionalist point of view it might be too late to prevent the spread of Asian carp and thus any expense spent on a barrier system would be a waste of money. Some opponents of the barrier think Asian carp prevention through CAWS is at best

## Should Chicago Restore the “Natural” Divide?

insufficient and at worst pointless. According to reporter Tina Lam of the Detroit Free Press, there are at least 13 other lesser-known pathways. She says “Carp breach wetlands during floods, dumping them into rivers leading to the lakes. In Indiana's Wabash River, spawning carp actually are closer to Lake Erie than spawning populations near Chicago are to Lake Michigan (*Lam 2006, 6*).

In addition to flooding and other lesser-known pathways, young Asian carp are sometimes used by fishers as bait who confuse the fish with more common forms of live bait. There is also an active trade in live fish for culinary uses mainly by urban Asian populations. It has been posited that this trade may lead to accidental deposits of carp. These possibilities have been used to support the “it’s too late” argument (*Egan 2006, 20*).

As Jeff Alexander, author of *Pandora's Locks: The Opening of the Great Lakes-St. Lawrence Seaway* puts it:

"The cold, hard reality was that the natural barriers that kept species in their native environments for millennia were bypassed by the instruments of modern society: vehicles, ships, pleasure boats, airplanes, dams, canals, and bridges. The Rocky Mountains were no longer a barrier to *Dreissena* mussels moving from the Great Lakes to California, just as the Atlantic Ocean was no barrier to the mussels migrating from Europe to North America. Human ingenuity created this unnatural menagerie, and we are now suffering its consequences." (2011, 346)

### **Historic Precedence and the Pride of the Port City**

For over a hundred years Chicagoans have taken advantage of technology and ingenuity to bend nature to their will in order to facilitate the transportation of goods. Opponents to the

## Should Chicago Restore the “Natural” Divide?

barrier feel a deep pride for this accomplishment and anticipate a bright future utilizing the waterways. The cleanup of the river and demand of residents has led to increase in riverfront green space, recreation, real estate and even a fleet of water taxis. Although at present less than 3% of all transportation of goods and people is by boat, there is great potential for growth. Industries are realizing that that this method of shipping is cheap, environmentally-friendly and energy efficient. A single 15-foot barge can carry the same amount of cargo as two 100-car trains or 870 trucks. Mayor Emanuel has suggested that by utilizing the CAWS we can alleviate congestion on streets and railroads. Furthermore the expansion of the Panama Canal in 2015 will potentially enable Chicago to return to its legacy as a port city (Lydersen 2011).

### *Economic Values*

Opponents feel that erecting the barriers would bring undue cost to the industries that depend on the waterways, and that the cause of stopping the spread of AIS isn't worth the expense. Members of the group Unlock Our Jobs believe that the government's role in the carp control can be construed as an attempt to overregulate their industry. Sagoff speaks to their doubts:

Critics often accuse federal agencies, such as the Department of Defense, of exaggerating threats in order to increase budgets. During this century, the Forest Service requested and received tens of billions of dollars to fight forest fires. Today, scientists regard fire as a natural and necessary part of forest ecology and suspect that Smokey Bear has done more harm than good. Federal agencies could spend as many billions to control alien species as they have spent to control forest fires. Yet, the

## Should Chicago Restore the “Natural” Divide?

movement of species has been a constant occurrence in natural history—like the occurrence of fire. Before we commit a lot of (taxpayer) money to controlling exotic species, it might be helpful to understand why we should treat alien creatures any differently than we treat native species. (Sagoff, p2)

This question is at the root of the functionalist-minded opponent’s arguments against the barrier. Those who oppose the barrier feel that groups supporting the barrier have grossly underestimated the financial hardship that would be caused by the closure of shipping lanes. Dr. Joseph Schwieterman’s 2010 study on the permanent closure of the lock system highlights the breadth of the anticipated losses and helps to shine light on why opponents of the barrier are concerned. The closure of the lock system was a suggested remedy to the spread of AIS, supported by several failed lawsuits.

Schwieterman found that over \$4 billion in commodities is shipped through these locks including energy products such as coal and petroleum. He estimated an annual \$1.3 billion impact on commercial shippers and barge operators that could translate to an increase in costs of consumers in commodities and utilities. There would be a total loss of \$4.7 billion over twenty years. If companies were forced to rely on overland transportation, there could be delays and jobs and property values could be negatively affected (Rodriguez 2011, 28). A 2008 report from the Illinois Terminal Port District cited in the study demonstrated that over 8,500 jobs are linked to the Port of Chicago.

Schwieterman’s study analyzed the economic impacts on all aspects of industry related to the CAWS:

For the first year after closures, the lost value consists of added transportation costs (\$125 million; inclusive of social costs), losses to recreational boaters (\$5

## Should Chicago Restore the “Natural” Divide?

million), consumers of river cruises and tours (\$20 million), municipal departments providing public protection (\$6 million), property owners (\$51 million), and regional agencies needing additional funds for flood abatement systems (\$375 million). (Schwiterman 2010, 1)

These numbers were calculated based on the closure of the lock system not the installation of strategically placed barriers. The economic challenges associated with the barriers, which would at most interrupt the flow of shipping at three points, would likely be different.

The plan proposed by the Great Lakes Commission offers solutions for the barriers. Each plan takes in consideration the concerns presented by stakeholders. Most include transportation modifications such as boat elevators, decontaminating stations and multi-modal shipping options. They insist that the shipping community will not only be able to continue as usual, but that with newly designed waterway system, use could be expanded. They argue that infrastructure building will lead to between 2,900 and 7,500 jobs annually over the 50-year term of the project along with increased economic activity. (GLS 15)

### **Conclusion**

Both parties express legitimate concerns for the future of the CAWS but they have reached a stalemate. The federal lawsuit filed by five states-Michigan, Wisconsin, Minnesota, Ohio and Pennsylvania along with the Grand Travers Band of Ottawa and Chippewa Indians in Michigan demanding that a separation solution be determined and enacted by the Army Corps of Engineers was recently denied—for the fourth time. U.S. District Judge John Tharp cited a federal law

## Should Chicago Restore the “Natural” Divide?

requiring the corps to “to keep shipping channels open between Lake Michigan and one of the Chicago waterways — the Des Plaines River — and prohibits constructing dams in any navigable waterway without Congress' consent.”

In a written ruling, Tharp said he was "mindful of, and alarmed by, the potentially devastating ecological, environmental, and economic consequences that may result from the establishment of an Asian carp population in the Great Lakes. But he said the proper way for the states to win approval of separating the waterways is through Congress” (Flesher 2012).

In the meantime, the Asian carp population in the northern waterways continues to expand; there have been recent discoveries of silver carp DNA in the North Channel of the Chicago River.

However, commercial fishers are taking an entrepreneurial approach to the invasion. “Asian Carp: If you can’t beat them? Eat them,” touted a WBEZ headline. Each carp weighs on average 15-25 pounds. At current market price, they fetch about 14 cents per a pound. Fishers make up for this fairly low price in volume. Demand for the fish is growing mostly among Asian communities in Chicago, New York and California. Senator Mike Jacobs has big plans for Asian Carp. He imagines a rebranding campaign that could make the fish more attractive to consumers. “Chilean Sea Bass wasn't always known as Chilean Sea Bass," he told the WBEZ reporter "There was a time it was known as a Patagonian Toothfish, and people wouldn't eat it." He suggests changing Asian’s carps name, "I'm from Rock Island, so I'm thinking of 'Rock Island Sole,'" he adds "Schafer Fisheries is near Savanna, [Ill.] so Savanna Sole might work, too" (Schaper 2006). I am already looking up recipes.

### References:

## Should Chicago Restore the “Natural” Divide?

Alexander, Jeff. *Pandora's Locks: The Opening of the Great Lakes-St. Lawrence Seaway*. Michigan State University Press, 2011.

Buck, Eugene H., Harold F. Upton, Charles V. Stern, and Cynthia Brougher. *Asian Carp and the Great Lakes Region*. CRS Report for Congress. Congressional Research Service, July 26, 2012. <http://www.fas.org/sgp/crs/misc/R41082.pdf>.

Egan, Dan. “Fish Barrier Vs. Carp DNA: What to Believe?” *Milwaukee Journal Sentinel*, August 25, 2012, Online edition. <http://www.jsonline.com/news/wisconsin/fish-barrier-vs-carp-dna-what-to-believe-4q5ru75-167454795.html>.

———. “Great Lakes, Great Peril | The Asian Carp Invasion.” *Milwaukee Journal Sentinel*, October 15, 2006, Online edition. <http://www.jsonline.com/news/wisconsin/29194474.html>.

Elicierto, Alfred. *A History of Asian Carp in the United States*. Digital, 2007.

<http://greatlakesoutdoors.files.wordpress.com/2012/08/carptime19g-color.jpg>.

———. *Asian Carp and the Great Lakes: Route to Lake Michigan Is Vulnerable*. Digital, 2007. <http://visualstoryteller.wordpress.com/2010/03/25/turning-back-the-asian-carp-2/>.

Flesher, John. “Asian Carp DNA Found in Chicago River Channel.” *Rockford Register Star*, October 10, 2012. <http://www.rrstar.com/updates/x233634389/Asian-carp-DNA-found-in-Chicago-River-channel>.

Flesher, John, and Tammy Webber. “Judge Tosses Asian Carp Suit; States Can Amend It - ABC News.” *ABC News Chicago*. Lansing, MI, December 4, 2012, Online edition. <http://abcnews.go.com/US/wireStory/judge-tosses-asian-carp-suit-states-amend-17871861#.UMWuPnf4KSo>.

Friends of the Chicago River. “Friends of the Chicago River.” Conservation Organization, 2011. <http://www.chicagoriver.org/home/index.php>.

## Should Chicago Restore the “Natural” Divide?

Green Mountain College. “Env. History & Phil. 01 (2012eb): Lecture 10: The Rise of Ecology”, n.d.

<http://moodle.greenmtn.edu/mod/page/view.php?id=2896>.

Hill, Libby. *The Chicago River: A Natural and Unnatural History*. 1st ed. Lake Claremont Press, 2000.

Hill, Walter, and Mark Pegg. *Evaluating Asian Carp Colonization Potential and Impact in the Great Lakes*. An Aquatic Invasive Species Research Project. National Sea Grant College Program, National Oceanic and Atmospheric Administration, August 31, 2008.

[http://www.iisgcp.org/research/reports/hill\\_final.pdf](http://www.iisgcp.org/research/reports/hill_final.pdf).

Huh, Nam Y. “Asian Carp On Taste Of Chicago Menu? State Officials Will Offer Free Samples Of Invasive Fish.” *Huffington Post*, July 11, 2012.

[http://www.huffingtonpost.com/2012/07/11/asian-carp-on-taste-of-ch\\_n\\_1665164.html](http://www.huffingtonpost.com/2012/07/11/asian-carp-on-taste-of-ch_n_1665164.html).

Hull, R. Bruce. *Infinite Nature*. University Of Chicago Press, 2006.

Kibel, Paul Stanton, ed. *Rivertown: Rethinking Urban Rivers*. The MIT Press, 2007.

Lam, Tina. “Asian Carp: A Six-Part Series Overview.” *Detroit Free Press*, July 17, 2011, Online edition, sec. Michigan news. <http://www.freep.com/article/20110717/NEWS06/307170001>.

Lodge, David M., and Kristen Shrader-Frechette. “Nonindigenous Species: Ecological Explanation, Environmental Ethics, and Public Policy.” *Conservation Biology* 17, no. 1 (February 2003): 31–37.

Lydersen, Kari. “Chicago Waterways Study Stirs Debate on Their Future.” *The New York Times*, December 31, 2011, Online edition, sec. U.S. <http://www.nytimes.com/2012/01/01/us/chicago-waterways-study-stirs-debate-on-their-future.html>.

## Should Chicago Restore the “Natural” Divide?

Mertens, Richard. “Asian Carp Invasion: Can We Fish Our Way Out of the Problem?” *Christian Science Monitor*, November 4, 2011. <http://www.csmonitor.com/USA/2011/1104/Asian-carp-invasion-Can-we-fish-our-way-out-of-the-problem>.

Moses, Harris. *Beyond the Electric Barrier*. Digital, July 19, 2011.

<http://cmsimg.freep.com/apps/pbcsi.dll/bilde?>

[Site=C4&Date=20110719&Category=NEWS05&ArtNo=107190387&Ref=H4&MaxW=300&B  
order=0&Asian-carp-Battle-lines-drawn-Chicago-ship-canal](http://cmsimg.freep.com/apps/pbcsi.dll/bilde?Site=C4&Date=20110719&Category=NEWS05&ArtNo=107190387&Ref=H4&MaxW=300&Border=0&Asian-carp-Battle-lines-drawn-Chicago-ship-canal).

Rodriguez, Nicole D. “The Asian Carp Threat to the Great Lakes: An Analysis of Alternatives for Preventing Asian Carp Migration.” *Policy Perspectives* 18, no. 1 (October 18, 2011).

<http://www.policy-perspectives.org/article/view/9352>.

Sagoff, Mark. “What’s Wrong with Exotic Species?” Institute for Philosophy and Public Policy, 1999.

<https://scholar.vt.edu/access/content/user/hullrb/PUBLIC/sagoffexoticspecies.pdf>.

Schaper, David. “Asian Carp: Can’t Beat Them? Eat Them.” Stream. *All Things Considered*. NPR, July 12, 2006. <http://www.npr.org/templates/story/story.php?storyId=5542199>.

Schwieterman, Joseph P. *An Analysis Of The Economic Effects Of Terminating Operations At The Chicago River Controlling Works And O’Brien Locks On The Chicago Area Waterway System*. Chicago, IL: DePaul University, Chaddick Institute, April 7, 2010. [http://unlockourjobs.org/wp-content/themes/unlockourjobs/pdf/DePaul\\_University\\_Study.pdf](http://unlockourjobs.org/wp-content/themes/unlockourjobs/pdf/DePaul_University_Study.pdf).

The Great Lakes Commission. “Restoring the Natural Divide: Separating the Great Lakes and Mississippi River Basins in the Chicago Area Waterway System”. The Great Lakes Commission and the Great Lakes and St. Lawrence Cities Initiative, January 2012. <http://www.glc.org/caws/>.

Unlock Our Jobs. “Unlock Our Jobs -.” *Unlock Our Jobs*, 2012. <http://www.unlockourjobs.org/>.

Should Chicago Restore the “Natural” Divide?