

United States District Court,
N.D. Illinois,
Eastern Division.
State of MICHIGAN, et al., Plaintiffs,
Grand Traverse Band of Ottawa and Chippewa Indians, Intervenor–Plaintiffs,
v.

UNITED STATES ARMY CORPS OF ENGINEERS, et al., Defendants,
City of Chicago, Coalition to Save Our Waterways, and Wendella Sightseeing Company,
Inc., Intervenor–Defendants.

No. 10–CV–4457.
Dec. 2, 2010.

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MEMORANDUM OPINION AND ORDER

ROBERT M. DOW, JR., District Judge.

*1 This litigation involves the Chicago Area Waterway System (“CAWS”), a system of man-made canals and natural waterways that serves as both a navigation link between Lake Michigan and the Mississippi River system and an outlet for the storm water and effluent of the City of Chicago. Plaintiffs are concerned about the spread of invasive silver and bighead carp (“Asian carp”) through the CAWS into Lake Michigan. Defendants, the United States Army Corps of Engineers (“Corps”) and the Metropolitan Water Reclamation District of Greater Chicago (“District”), have created, maintained, and continue to operate and control facilities within the CAWS that link Illinois waters to Lake Michigan and other connected waters.

On July 19, 2010, the States of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania (collectively “Plaintiffs” or the “States”) filed a complaint against the Corps and the District (collectively “Defendants”).^{FN1} Plaintiffs ask the Court to issue a preliminary and permanent relief in the form of a mandatory injunction compelling Defendants to take all available measures, consistent with the protection of public health and safety, to prevent the emigration of Asian Carp through the CAWS into Lake Michigan. The most recent ^{FN2} measures sought by Plaintiffs include, but are not necessarily limited to, the following:

FN1. Plaintiffs' requested relief comes on the heels of Plaintiff Michigan's unsuccessful bid to persuade the Supreme Court of the United States to address the subject matter of this dispute.

FN2. Plaintiffs have modified their requested relief since filing their initial motion for preliminary injunction.

(a) using the best available methods to block the passage of, capture, or kill bighead and silver carp that may be present in the CAWS, especially in those areas north of the O'Brien Lock and Dam;

(b) temporarily closing and ceasing operation of the locks at the O'Brien Lock and Dam and the Chicago River Controlling Works except as needed to protect public health and safety;

(c) installing and continuously maintaining permanent grates or screens, along with any

debris removal equipment necessary to prevent blockage or clogging of such grates or screens, on or over the openings to all the sluice gates at the O'Brien Lock and Dam, the Chicago River Controlling Works, and the Wilmette Pumping Station in a manner that conforms to the specifications detailed in Appendix A to the Corps' Interim III Report or otherwise will be as effective at preventing Asian carp from passing through these structures as the grates or screens specified in that Report ^{FN3};

FN3. Plaintiffs' original request was to close all sluice gates "except as needed to protect public health and safety."

(d) installing and maintaining block nets or other suitable interim physical barriers to fish passage as needed in the Little Calumet River to prevent the migration of bighead and silver carp into Lake Michigan, in a manner that protects public health and safety;

(e) as a supplement to physical barriers, applying rotenone at strategic locations in the CAWS, especially those areas north of the O'Brien Lock and Dam where bighead and silver carp are most likely to be present, using methods and techniques best suited to eradicate them and minimize the risk of their movement into Lake Michigan;

(f) continue comprehensive monitoring for bighead and silver carp in the CAWS, including resumed use of environmental DNA testing;

*2 (g) obtaining, at the earliest possible date, bulkheads suitable to allow closure of the O'Brien Lock; and

(h) within 90 days of the entry of the Court's Order on Plaintiffs' motion for preliminary injunction, file with the Court plans to effectuate relief requested by Plaintiffs in paragraph 1, including, as needed, designs, plans, and schedules for installation, operation, and maintenance of the physical barriers described in paragraph 1(d) [sluice gate screens and debris removal] and (e) [block nets in the Little Calumet River].

Plaintiffs also ask the Court to enter an injunction requiring the Corps to expedite the preparation of a feasibility study which develops and evaluates options for the permanent physical separation of the CAWS from Lake Michigan at strategic locations to prevent the transfer of Asian Carp or other invasive species between the Mississippi River Basin and the Great Lakes Basin, and to order Defendants to implement, as soon

as possible, permanent measures to physically separate Illinois waters from Lake Michigan.

Having carefully considered the voluminous written submissions of all the parties ^{FN4} as well as the testimony and argument presented to the Court on August 23, September 7, 8, and 10, and October 18, 2010, the Court determines that Plaintiffs have not met the high burden necessary to obtain a mandatory preliminary injunction. In the face of multi-agency efforts to prevent Asian carp migration—efforts that have only increased and expanded in the months since this lawsuit was filed—Plaintiffs have not shown either a sufficient likelihood of success on the merits of their substantive claims or a sufficient prospect of irreparable harm absent the requested injunction.

FN4. In a memorandum opinion and order [101] entered on August 20, 2010, the Court granted motions to intervene filed by Intervenor–Defendants the City of Chicago, The Coalition to Save Our Waterways (“Coalition”), and Wendella Sightseeing Company, Inc. (“Wendella”). On August 31, 2010, the Grand Traverse Band of Ottawa and Chippewa Indians (“Grand Traverse Band”) filed a motion to intervene on Plaintiffs' side of the case [122]. In their motion, the Grand Traverse Band indicated that it did not intend to participate in the preliminary injunction stage except as an observer. The Court grants by separate minute order the Grand Traverse Band's motion [122] to join the case as an Intervenor–Plaintiff.

I. Background

A. The Chicago Area Waterway System (“CAWS”)

The CAWS is an integral part of the Lake Michigan water diversion project that had its genesis more than 100 years ago. As noted above, the CAWS serves as both a navigation link between Lake Michigan and the Mississippi River system and an outlet for the storm water and effluent of the City of Chicago. The canal system extends between Lake Michigan and the Des Plaines River, a tributary of the Illinois River and ultimately of the Mississippi River. The canal system was originally constructed to permit Chicago to dilute and dispose of its waste water without discharging all of it into Lake Michigan. Using the canal system, Illinois redirected the Chicago River, which naturally flowed east into Lake Michigan, to flow west, carried by the canal system into the Des Plaines. The Chicago Harbor Lock and Chicago River Controlling Works (“Chicago Lock and Controlling

Works”) were constructed at the confluence of the Chicago River and Lake Michigan. The permanent connection between Lake Michigan and the Mississippi drainage basin was made with the completion of the Chicago Sanitary and Ship Canal (“CSSC”) in 1900. See *Missouri v. Illinois*, 200 U.S. 496, 26 S.Ct. 268, 50 L.Ed. 572 (1906). Subsequent construction included the dredging and reversal of the Calumet River, the erection of the Thomas J. O’Brien Lock and Dam (“O’Brien Lock”) on that river, and the construction of the Cal–Sag Channel linking the Calumet with the main canal. The waterway system also includes the Grand Calumet and Little Calumet Rivers, which cross the Illinois–Indiana border and provide access to Lake Michigan at points in Indiana.

*3 By statute, the Corps operates and maintains the CSSC to sustain navigation from Chicago Harbor on Lake Michigan to Lockport on the Des Plaines River. See, e.g., Act of Dec. 4, 1981, Pub.L. No. 97–88, § 107, 95 Stat. 1135; Act of July 30, 1983, Pub.L. No. 98–63, Tit. I, Ch. IV, 97 Stat. 301. Vessels enter and exit the Chicago end of the canal system through the O’Brien and Chicago Locks. The Corps operates both locks in accordance with applicable statutes, regulations, and agreements with the District.

Both the Chicago Lock and Controlling Works and the O’Brien Lock are used for flood control purposes and water diversion, pursuant to agreements between the Corps and the District. During severe rain events, the locks and the sluice gates are opened to abate the risk of flooding by drawing water from the canal system into Lake Michigan.^{FN5} The Corps owns the sluice gates at the O’Brien Lock and operates them under the direction of the District. The District owns and operates the sluice gates at the Chicago River Controlling Works. The District also owns and operates the Wilmette Pumping Station on the North Shore Channel, which includes pumps and a sluice gate; the Corps has no involvement in the operation of the Wilmette Pumping Station.

FN5. The Chicago lock and sluice gates recently were opened for flood control purposes in July 2010, to allow approximately 5.7 billion gallons of storm water to flow into Lake Michigan.

Approximately seven million tons of cargo pass through the O’Brien Lock each year, as do more than 19,000 recreational boats, many of which are docked on the Calumet River and reach Lake Michigan through the lock. Additional cargo, ferry, and recreation boats use the Chicago Lock. The locks also are used by the Coast Guard stations on the Lake Michigan side of the locks in responding to safety emergencies on the canal and in

patrolling infrastructure facilities in the river system. The CAWS and its associated structures, as currently maintained and operated by the District and the Corps, provide a potential conduit for the movement of fish and other biota, including Asian carp, between the Illinois River and Lake Michigan at multiple locations on the shore of Lake Michigan.

B. Asian Carp

Several species of carp native to Asia have been imported to the United States for various reasons, including experimental use in controlling algae in aquaculture and wastewater treatment ponds. Two species of Asian carp are of particular concern here: silver carp, which can grow to lengths of three feet and weights of 60 pounds, and big-head carp, which can grow to lengths of five feet and weights approaching 100 pounds. Both silver and bighead carp readily adapt to a variety of environmental conditions, reproduce prolifically, and spread rapidly. Since their escape from ponds in the lower Mississippi River basin, both silver and bighead carp populations have become established in rivers in the Mississippi River Basin, including the Illinois River. Asian carp have substantially disrupted and in some areas largely displaced native fish populations in these rivers, impairing recreational and commercial fishing. Also, because of their large size and jumping ability, silver carp have injured boaters and caused property damage.

*4 It is clear that the potential migration of Asian carp through the CAWS into Lake Michigan presents a threat of environmental and economic harm, as recognized by the Corps,^{FN6} the United States Fish and Wildlife Service (“USFWS”),^{FN7} and the Illinois Department of Natural Resources (“Illinois DNR”).^{FN8} The Corps, other federal agencies, and their Illinois counterparts have been aware for some time of the possibility that Asian carp could travel through the CAWS into the Great Lakes. As further explained below, various agencies have formed the Asian Carp Regional Coordinating Committee (“ACRCC”), with the goal of preventing Asian carp from establishing a sustainable population that threatens the Great Lakes. The ACRCC members include the Corps, USFWS, U.S. Coast Guard, U.S. Geological Survey, Illinois DNR, Indiana Department of Natural Resources, Ohio Department of Natural Resources, Great Lakes Fishery Commission, City of Chicago, and the District. The ACRCC's member agencies have taken steps to combat the spread of Asian carp. The Asian Carp Control Strategy Framework (“Framework”), drafted by the ACRCC and commented on by Plaintiffs, includes more than thirty steps, including: intensive efforts to monitor, confine, capture and kill Asian carp in the waterway, using electrofishing, netting, environmental DNA (“eDNA”) sampling, side-scan sonar, and trained observation divers; scientific efforts to develop

carp-specific poisons and “bio-bullets,” attractant and repellent pheromones, and sonic or electrical means to disrupt carp reproduction; and further validation of the Coast Guard's already-in-place restrictions to prevent the possibility that Asian carp or carp eggs might be carried through vessels' ballast or bilge water.^{FN9}

FN6. For example, the Corps has acknowledged:

Asian carp have the potential to damage the Great Lakes and confluent large riverine ecosystems by disrupting the complex food web of the system and causing damage to the sport fishing industry. Two species of Asian carp, bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*H. molitrix*), have become well established in the Mississippi and Illinois River systems exhibiting exponential population growth in recent years. Certain life history traits have enabled bighead and silver carp to achieve massive population numbers soon after establishing. Currently, the Illinois River is estimated to have the largest population of bighead and silver carp in the world. The prevention of an inter-basin transfer of bighead and silver carp from the Illinois River to Lake Michigan is paramount in avoiding ecological and economic disaster.

FN7. A 2004 United States Fish and Wildlife publication similarly stated:

Bighead and silver carp are in the Illinois River, which is connected to the Great Lakes via the Chicago Sanitary and Ship Canal. Asian carp pose the greatest immediate threat to the Great Lakes ecosystem.... Bighead and silver carp could colonize all of the Great Lakes and sustain high-density populations. High densities would likely result in declines in abundance of many native fishes.

FN8. In November 2009, the Illinois Department of Natural Resources in November 2009 stated:

Asian carp could have a devastating effect on the Great Lakes ecosystem and a significant economic impact on the \$7 billion fishery. Once in Lake Michigan, this invasive species could access many new tributaries connected to the Great Lakes. These fish aggressively compete with native commercial and sport fish for food. They are well suited to the water temperature, food supply, and lack of predators of the Great Lakes and could quickly become the dominant species.

Once in the lake, it would be very difficult to control them.

FN9. When vessels take on water for stability (ballast water) or accumulate water in their void spaces (bilge water) in one location and discharge it in another, the possibility exists that invasive species may be transmitted. To prevent Asian carp from crossing the dispersal barrier in ballast or bilge water, the Coast Guard first requested that the barge industry cease ballasting operations on either side of the barrier and then adopted a temporary interim rule barring ships from discharging in the canal on one side of the barrier any ballast or bilge water that was taken on in the canal on the other side of the barrier.

Turning to specifics, Congress has given the federal agencies a number of tools to combat the threat of Asian carp migration into the area. For example, in 1996, Congress directed the Corps to “investigate and identify environmentally sound methods for preventing and reducing the dispersal of aquatic nuisance species” between the Great Lakes basin and the Mississippi River basin through the CSSC, and authorized the Corps to carry out the dispersal barrier demonstration project. See Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended by the National Invasive Species Act of 1996, 16 U.S.C. §§ 4722(i)(3)(A) and (3)(C). Pursuant to Congressional authorization, the Corps has adopted a four-pronged strategy to prevent the dispersal of Asian carp through the CSSC: (i) designing, constructing, maintaining, and improving the electric fish dispersal barrier; (ii) monitoring for the presence of Asian carp in the CAWS; (iii) executing an efficacy study regarding the dispersal barrier so that near-term solutions to evolving information can be devised and applied; and (iv) executing the long-term Great Lakes and Mississippi River Inter-Basin Study (“GLMRIS”) study in order to, among other things, gain a scientifically-based understanding of the impacts of various long-term solutions and make recommendations for permanent solutions.

***5** As discussed in greater detail below, the first electric dispersal barrier (“Barrier I”) became operational in 2002. In 2003, the Corps began the design and construction of a permanent electric dispersal barrier (“Barrier II”) under Section 1135 of the Continuing Authority Program. See Water Resources Development Act of 1986, Pub.L. No. 99–662, § 1135, 33 U.S.C. § 2309a. In 2005 and 2007, Congress specifically authorized the construction of Barrier II, and authorized the Corps to upgrade and make permanent Barrier I. See District of Columbia Appropriations Act, 2005, Pub.L. No. 108–335, § 345, 118 Stat. 1352; Water Resources Development Act of 2007 (“2007 WRDA”), Pub.L. No.

110–114, § 3061(b)(1), 121 Stat. 1121. A second dispersal barrier (“Barrier IIA”) was constructed in 2006 and, after extensive testing, went into operation in April of 2009. A third dispersal barrier (“Barrier IIB”) is under construction and the Corps expects to put it into full service by the end of fiscal year 2010.

In addition to authorizing further construction on the electric dispersal barrier, the 2007 Water Resources Development Act authorized the Corps to study the efficacy of the dispersal barrier in preventing Asian carp from migrating through it, and its susceptibility to being bypassed (“Efficacy Study”). See 2007 WRDA § 3061(b)(1)(D). As set forth in greater detail below, the Corps is conducting the Efficacy Study in interim steps, and anticipates completion of the Final Efficacy Study by Spring 2011. The 2007 WRDA also authorized the Corps to consult with appropriate Federal, State, local, and nongovernmental entities in order to conduct a “feasibility study of the range of options and technologies available to prevent the spread of aquatic nuisance species between the Great Lakes and Mississippi River Basins through the Chicago Sanitary and Ship Canal and other aquatic pathways.” See 2007 WRDA § 3061(d). Assuming sufficient funding, the Corps estimates that the earliest anticipated completion date for the CAWS portion of this long-term feasibility study, also known as GLMRIS, would be 2015.

In Section 126 of Fiscal Year 2009's appropriations legislation for the Corps (“Section 126”), Congress granted the Secretary of the Army temporary emergency authority to undertake “such modifications or emergency measures as [he] determines to be appropriate, to prevent aquatic nuisance species from bypassing the [electric barrier] and * * * to prevent aquatic nuisance species from dispersing into the Great Lakes.” Energy and Water Development and Related Agencies Appropriations Act, 2010, Pub.L. No. 111–85, § 126, 123 Stat. 2845 (2009). The Secretary has delegated that authority to the Assistant Secretary of the Army (Civil Works). The Section 126 authority was scheduled to expire on October 28, 2010; however, the parties indicated at the October 18 hearing that the Section 126 authority has been extended through a continuing resolution until at least December 3, 2010.

*6 Additionally, legislation is currently pending before Congress that would provide the Corps with further authority to address the migration of aquatic nuisance species through the CAWS. The Permanent Prevention of Asian Carp Act of 2010 (S. 3553 and H.R. 5625) would require the Corps to study the feasibility and best means of implementing the hydrological separation of the Great Lakes and Mississippi River basins, and prepare a

final report within eighteen months. Section 3013 of the Water Resources Development Act of 2010 (H.R.5892) would amend Section 3061(d) of the 2007 WRDA to require that the Corps' long-term feasibility study include a "fully developed analysis of an alternative for hydrologic separation between the Great Lakes and the Mississippi River basins." H.R. 5892 also would authorize the Corps to upgrade and/or relocate Barrier I and to construct additional barriers or other fish deterrents in the vicinity of the CAWS.

In addition to the focus on the CAWS above the fish barriers, additional agencies have been undertaking further steps to reduce the threat to the Great Lakes, such as using commercial fishing to reduce the Asian carp population below the fish barriers, enforcing prohibitions on transporting injurious wildlife, and educating the public about the dangers that Asian carp pose. The ACRCC also has been studying other potential pathways for Asian carp to enter the Great Lakes. For example, the ACRCC is working with Plaintiff Ohio to specifically address the Maumee River, which has been identified as a potential pathway for Asian carp to escape into Lake Erie from Indiana's Wabash River.

C. Efforts to Prevent Asian Carp from Migrating to the Great Lakes

1. eDNA

For some time, federal and state agencies have used telemetry (fish tagging and tracking), electrofishing (a technique that uses electrodes to attract and stun fish for easy capture), and commercial netting to monitor Illinois waterways for the migration of Asian carp. However, because those technologies are limited in their ability to detect fish present in very small numbers, the Corps decided to canvass the scientific community for additional, more sensitive detection technologies. As a result, in August 2009, the Corps entered into a cooperative agreement with the University of Notre Dame to use an experimental technique known as environmental DNA ("eDNA") testing. Fish shed DNA into the environment in various microscopic bits of tissue, such as intestinal cells released during defecation. The eDNA technique involves collecting water samples, filtering them for solids, extracting all DNA from the solids, and then analyzing the DNA for genetic markers unique to the bighead and silver carp species.

In December 2009, this eDNA testing method was examined in detail by a four-member team of experts. The quality assurance ("QA") audit team was led by the Environmental Protection Agency with an observer from the Corps also present. In their

Summary, the QA team confirmed that the genetic markers utilized by the eDNA testing method detected only the target fish species, endorsed the eDNA testing field and laboratory protocols, acknowledged that the methods used during testing minimized the possibility of reporting false positive results, and concluded: “Our team believes that the eDNA method [that the Corps is] using is sufficiently reliable and robust in reporting a pattern of detection that should be considered actionable in a management context. We have a high degree of confidence in the basic PCR method [that the Corps is] using for detecting Silver and Bighead carp environmental DNA.”

*7 As discussed in greater detail below, Plaintiffs' expert Dr. David Lodge of the University of Notre Dame testified that a series of eDNA results collected between in 2009 and 2010 indicates the presence of Asian carp DNA in the CAWS north of the Lockport Lock, in the North Shore Channel, in the Calumet–Sag Channel in the vicinity of the O'Brien Lock, in the Calumet River, and in Calumet Harbor.^{FN10} In December 2009, a single, dead bighead carp was recovered from the CAWS north of the Lockport Lock (but below the barrier), and on June 22, 2010, a single, live bighead carp was recovered from Lake Calumet, north of the O'Brien Lock and Dam, six miles from Lake Michigan (and above the barrier). No physical barriers to fish passage currently exist anywhere between the O'Brien Lock and Lake Michigan.

FN10. There have been sixty positive eDNA samples taken from above the barrier. At this stage, eDNA testing cannot identify whether one or more individual fish are responsible for a positive result. Additionally, the testing cannot yet identify whether each positive result comes from a distinct fish, or whether the presence of one fish may generate multiple positive results.

The Corps and the District have suggested other possible explanations for the existence of Asian carp DNA in the CAWS, such as excrement from humans or birds that have eaten Asian carp, Asian carp released or disposed by humans in the CAWS, or release of ballast water that might contain Asian carp DNA. Dr. Lodge considered and rejected all of those explanations in favor of the conclusion that the eDNA results mean that a live Asian carp was in the vicinity of the sampled water within two days of the sampling:

Based on our understanding of the waterway and other potential pathways, we believe that no explanation other than the presence of multiple living silver and bighead carps

can plausibly explain the entire spatial and temporal pattern of positive results for silver and bighead eDNA in the waterway. The presence of living silver and bighead carps north of the electric barriers is most plausibly explained by failures of the electric barrier to completely restrict the northward movement of silver and bighead carps.

At present, eDNA evidence cannot verify definitively whether live Asian carp are present, the number of Asian carp in an area, or whether a viable population of Asian carp is present. Also, a positive result does not reveal how Asian carp DNA traveled to that location. For example, the current testing does not explain whether the DNA is from a live or dead Asian carp, from water containing Asian carp DNA transported from other locations, or other sources. However, at least one witness on the defense side of the case agreed with Dr. Lodge's assessment that the presence of Asian carp DNA probably indicates the presence of at least one live Asian carp in the area of the positive test. The Corps has contracted with Battelle Corporation to perform an independent external peer review of eDNA sampling and processing. Results of the peer review are expected to be complete by December 2010.

2. Netting, Fishing, and Poisoning

In addition to eDNA testing and analysis, the ACRCC continues to rely on netting and fishing operations conducted by the State of Illinois, USFWS, and Corps employees to inform the Corps and other agencies about the potential presence of Asian carp above and below the barrier.^{FN11} During February and March 2010, USFWS crews sampled fixed sites prescribed in the monitoring plan, choosing the sites based on which sites had multiple eDNA positive samples and which sites were likely habitat for Asian carp. Fixed site sampling consists of one crew of three biologists conducting electrofishing operations. During these sampling events, no Asian carp were collected. Sampling efforts also were conducted in May 2010 in the North Shore Channel in response to positive eDNA results. Six federal and state crews conducted netting and electrofishing operations, and commercial fishers were contracted to assist in netting operations. No Asian carp were captured during that effort.

FN11. In the past year, the resource agencies have conducted 3,200 hours worth of surveying.

*8 The ACRCC monitoring plan indicated that positive eDNA detections within a portion of the Little Calumet River in the Chicago Area Waterway during 2009 and 2010

warranted a response action to capture and remove any Asian carp. From May 20 through May 27, 2010, the multi-agency team authorized the application of a fish poison called rotenone to an approximately two and a half mile stretch of river immediately below the O'Brien Lock and Dam. More than 130,000 pounds of fish were collected; however, no Asian carp were found.

On June 22, 2010, one bighead carp was captured in Lake Calumet during a commercial fishing operation conducted pursuant to the workgroup's plan. This was the first Asian carp captured above the electrical barriers in the CAWS. The capture prompted another sampling during the week of June 28, 2010. For eleven days, three USFWS crews and one crew from the Great Lakes Indian Fish and Wildlife Commission joined Illinois DNR crews and contracted commercial fishers in electrofishing and netting in the Calumet River from the O'Brien Lock and Dam to Lake Michigan. Agency crews deployed in excess of 16,500 yards of trammel nets and two seine hauls using a 2,400-foot seine. More than ten miles of commercial nets were set, resulting in a total catch of more than 15,000 fish of seventeen species. No additional Asian carp were captured.

3. Electronic Barriers

As previously set forth, in 1996, Congress directed the Corps to study preventive measures to keep invasive species out of the CSSC. 16 U.S.C. § 4722(i)(3). Since that time, the Corps has constructed two electric barriers and is constructing a third on an expedited basis. An electric dispersal barrier operates by creating an electrical field in the water of the canal, which either immobilizes fish or creates sufficient discomfort to deter them from attempting to pass through the area. The field is created by running direct electrical current through steel cables secured to the bottom of the canal. The barriers are located at the southwestern end of the canal, a short distance above the Lockport Lock. The first electric dispersal barrier (Barrier I) was authorized by Congress in 1996 and became operational in 2002. In January 2003, the design and construction of a second barrier (Barrier IIA), which has greater capabilities, was approved under Section 1135 of the Continuing Authority Program, Water Resources Development Act of 1986, Pub.L. No. 99-662, § 1135, 100 Stat. 4082, and then specifically authorized by Congress in 2005 and expanded in 2007. Barrier IIA was operational by March 2006, and after trials and safety testing to address potential risks to human life and to vessels in navigation, has been in full-time operation since April 2009.^{FN12} The third barrier (Barrier IIB), which is scheduled to be completed in 2010, is designed to be at least as capable as Barrier IIA. Having both barriers in operation will permit one to continue operating during periods that

the other must be shut down for maintenance. Due to safety concerns, the Corps operates these dispersal barriers in consultation with the Coast Guard.

FN12. In August 2009, after monitoring showed that Asian carp might have advanced further up the waterway toward the barrier than previously expected, the Corps increased the voltage and modified other operating parameters of Barrier IIA.

*9 Barrier IIA was taken offline for necessary maintenance in early December 2009, while Barrier I remained in operation. Barrier I then underwent maintenance after Barrier IIA resumed operation. To combat the threat that Asian carp would cross through the barrier location while one of the barriers was offline, the USFWS and other participating agencies—including the Michigan Department of Natural Resources—executed a “Rapid Response” containment operation, applying the fish poison rotenone to a 5.7-mile stretch of the canal downstream of the fish barriers, between the barriers and the Lockport Lock. Caged carp were used to verify that the poisoning was effective to kill fish at various depths throughout the treated stretch of the canal. Biologists collected between 30,000 and 40,000 dead or surfaced fish during this operation. One dead Asian carp was found five miles downstream of the barriers.

4. Efficacy Study

Since January 2009, the Corps, as directed by Congress, has been conducting studies to evaluate threats to the effectiveness of the electric barrier (“Efficacy Study”). Upon the discovery of the first positive eDNA evidence in the CAWS in late July 2009, the Corps has undertaken four interim studies—Interim I, II, III, and IIIA—on an accelerated basis. The Assistant Secretary has approved three of those recommendations under her authority under Section 126. The Corps anticipates completion of the Final Efficacy Study by Spring 2011, following public review of the final draft study in late 2010.

In Interim I, the Corps studied whether it was possible for Asian carp to enter the CSSC from either the Des Plaines River or the Illinois and Michigan Canal (“I & M Canal”), both of which parallel the CSSC below and above the barrier. The Corps determined that a significant flood could open pathways through which any Asian carp that might be present in the Des Plaines River or I & M Canal could access the CSSC above the fish barrier, and thus bypass it. Therefore, the Interim I Report recommended construction of jersey-type barriers and, where physical barriers would induce flooding, tight reinforced

mesh fencing, between the Des Plaines River and the CSSC. The study also recommended the blockage of culverts between the CSSC and the I & M Canal. Approved by the Assistant Secretary in January 2010 pursuant to Section 126, the construction along the I & M Canal and the Des Plaines River has been completed as of October 2010.^{FN13} Interim II will further refine the optimal operating parameters for the fish barriers, including potential safety risks of a change in operation. The Corps intends to complete the study in 2010.

FN13. During a flood event in the Chicago area on July 23–25, 2010, the barriers that already had been completed—which include those along the I & M canal and portions of those along the Des Plaines River—performed as designed.

Interim III evaluated whether and how to modify the operation of the Chicago and O'Brien locks to deter Asian carp migration into the Great Lakes. The Assistant Secretary approved the Interim III Report on July 13, 2010. In response to the discovery of Asian carp eDNA above the electric barrier in late 2009, the Corps looked at what additional tools could be used to impede Asian carp migration. Specifically, the Corps considered whether structures in the CAWS, including the locks, pumping stations, and sluice gates, could be operated so as to impede fish passage while continuing their use for their intended purposes.

***10** In order to evaluate the impact of temporarily closing the locks, the Corps sent a formal request to the USFWS, requesting a risk analysis of the proposed alternatives for modifying operations of the Chicago and O'Brien Locks. In the short term, the Corps was considering a range of alternative lock operations within its existing statutory authorities that would increase the time that the locks would be closed. The six alternatives included:

- (i) Continue current operations;
- (ii) Lock closure of three to four days a week and normal operations for the remaining days of the week;
- (iii) Lock closure of one week/month and normal operation for the remaining days of the month;
- (iv) Lock closure every other week and normal operations for the alternative weeks;

(v) Lock closure of two months with extensive monitoring to determine if Asian carps are in the CAWS. If no Asian carp are collected during the closed period, then lock operations will be resumed at the end of the closure period. Locks would remain open, unless there was a significant flow event (flow rate trigger TBD) that could trigger fish movement. Locks would be closed on an emergency basis while monitoring activities were executed; and

(vi) Two-week lock closure, in mid-late April, during which extensive surveillance and monitoring is conducted. If no Asian carp are recovered, then the locks will operate normally. However, if there is a significant rainfall event that results in elevated flows (and a possible stimulus for Asian carps to move upstream) after the two weeks of surveillance/monitoring, then the locks would be closed as soon as possible. During the lock closure, resources could be mobilized to complete surveillance/monitoring for a week. If no Asian carp are captured during the week, then the locks would be reopened.

To complete the risk analyses, a panel of ten experts (from the Corps, Illinois DNR, Illinois Environmental Protection Agency, Illinois Natural History Survey, U.S. Geological Survey, and USFWS) was convened. Individuals were selected: (1) based on their expertise and knowledge related to the technical questions that formed the basis of the review, and (2) to ensure broad representation of the various entities engaged in Asian carp containment in the CAWS. Nine experts completed various components of the risk analysis form, which was composed of sections focusing on: (1) risk assessment of possible lock operation alternatives, and (2) biological, ecological, and risk management questions posed by the Corps. Some experts completed only limited sections of the form, because their expertise was specific to discrete topics considered in the risk analysis.

Of the six alternatives, there was no individual or combination of lock operation scenarios that the experts believed would lower any risk that exists of Asian carp establishing self-sustaining populations in Lake Michigan in a meaningful way. In other words, nine scientific experts concluded that the temporary closure of the locks would not make a difference to the migration because the locks would be opened during some periods. The experts did provide limited options (control/prevention techniques, etc.) that may, if implemented, potentially lower the risk of Asian carp establishment in Lake Michigan related to any lock operation alternative. But none of the options provided by the experts to lower risk of lock operation alternatives was recommended by more than one expert, so there

was no clear consensus about how to manage the risk.

***11** Based on the results of the expert panel and other factors as set forth in the Interim III Report, the Corps decided to use the intermittent closure of the Chicago and O'Brien locks, on an as-needed basis, in support of fish control and eradication efforts performed by the resource agencies, upon the request of those agencies and in coordination with the Coast Guard. In addition, based on the analysis and recommendations in the Interim III Report, under Section 126, the Assistant Secretary approved the installation of steel bar screens to block fish passage through two of the four sluice gates at the O'Brien Lock and Dam.^{FN14} The bar screens are designed to prevent adult Asian carp from passing through sluice gates during the times that the gates are open for water intake from Lake Michigan into the CAWS. During flood events, the bar screens will be removed to avoid clogging the screens with debris. The Corps was to install the bar screens in September 2010. The District has installed bar screens on two of the sluice gates at the Chicago River Controlling Works.

FN14. The Corps maintains that the other two sluice gates are used for flood control only and cannot be screened given the need to accommodate flood waters without becoming blocked with debris. The District cites the same concerns in refusing to install screens on all sluice gates that it controls.

Also on July 13, 2010, the Assistant Secretary approved the Interim IIIA Report. That report recommended implementing a fish deterrent barrier—employing acoustic, bubble curtain, and strobe light technology to encourage Asian carp to disperse—to examine the efficacy of the dispersal technology. The project would be located at the Brandon Road Lock and Dam on the Des Plaines River just south of the city of Joliet, Illinois. However, because the project could not be completed by the then-scheduled expiration of the Section 126 authority on October 28, 2010, the Corps determined that it could not implement the project unless Congress enacted legislation to extend the emergency implementation authority of Section 126.^{FN15}

FN15. As noted above, pursuant to a continuing resolution, the Section 126 authority has been extended through December 3, 2010.

According to the Corps, the agencies will prepare a final report which will summarize the interim reports and recommend a long-term, multi-agency, comprehensive strategy to

improve the efficacy of the dispersal barriers and additional measures throughout the CAWS to minimize the risk of Asian carp migrating into Lake Michigan. The final report will include assessments of pathways around and beyond the fish barrier in order to determine the advisability and feasibility of permanent solutions to potential bypasses from the Des Plaines River and I & M Canal. It also will consider additional fish barriers or other impediments to the migration of Asian carp and other aquatic invasive species through the CAWS, including through the Grand and Little Calumet Rivers, into Lake Michigan. Finally, it will review potential operational changes to existing Corps waterway structures to determine whether any new information might warrant a change from the approach evaluated in Interim III.

5. Longer-Term Solutions

The Corps also embarked on a larger study—known as the Great Lakes and Mississippi River Inter-Basin Study (“GLMRIS”)—of how to prevent transfers of aquatic invasive species between the Mississippi River basin and the Great Lakes basin, in either direction, “through [both] the Chicago Sanitary and Ship Canal and other aquatic pathways.” Although the study has a time frame of a number of years, with additional time required for Congressional authorization for implementation, the Corps intends to conduct the study in a way that allows decisions on particular recommended steps to be made as soon as the relevant portion of the study is complete, rather than awaiting completion of the entire project.

D. Plaintiffs' Requests

*12 Plaintiffs maintain that neither the Corps nor the District have taken the comprehensive actions necessary to abate what they term a public nuisance. Since Asian carp eDNA was first detected in the CAWS on the lakeward side of the Dispersal Barrier System, Plaintiff States have urged Defendants to take additional actions to minimize the risk that Asian carp will migrate through the CAWS into Lake Michigan. The requested actions mirror the relief sought in the present lawsuit. Specifically, Plaintiffs have taken the following steps:

- (1) A December 2, 2009 letter from the Attorney General of the State of Michigan to the Corps, the District, and Illinois;
- (2) The State of Michigan's December 21, 2009 motion to reopen and for supplemental decree in the United States Supreme Court, together with a motion for preliminary in-

junction. The States of Wisconsin, Minnesota, New York, Ohio and Pennsylvania filed responses in the Supreme Court supporting the relief requested by Michigan;

(3) The State of Michigan's February 4, 2010 renewed motion for preliminary injunction in the United States Supreme Court, reiterating its request for preliminary injunctive relief based on new eDNA sampling results indicating that Asian carp DNA was found in Calumet Harbor. The States of New York, Minnesota and Wisconsin filed briefs in support of Michigan's renewed motion for preliminary injunction;

(4) The Michigan Attorney General's February 18, 2010 written comments on the Draft Asian Carp Control Strategy Framework issued by the Asian Carp Regional Coordinating Committee;

(5) A May 19, 2010 letter from the Attorneys General of Plaintiff States to Commander and Division Engineer Major General Peabody of the Corps, copied to the District, following the release of a Revised Asian Carp Control Strategy Framework, and a press release announcing a plan for applying the fish toxicant Rotenone in one segment of the Calumet Sag Canal.

In response, the Corps and the District have maintained that while they continue to work cooperatively with state and local partners to prevent Asian carp from entering the Great Lakes and establishing a population there, the relief requested by Plaintiffs could threaten public safety and flood control, substantially affect regional and national economies, and greatly disrupt transportation systems on which those economies rely. Specifically, the District has maintained that it must be able to continue unrestricted operation of sluice gates at the Wilmette Pumping Station and Chicago River Controlling Works not only for flood control, but also for navigation and discretionary diversion purposes. The Corps maintains that there is insufficient evidence that Asian carp are present in substantial numbers in the CAWS beyond the Dispersal Barrier System and has rejected permanent and temporary closures of the Chicago and O'Brien Locks.

On June 3, 2010, the Corps released a report entitled "Interim III, Modified Structural Operations, Chicago Area Waterways Risk Reduction Study and Integrated Environmental Assessment" ("Interim III"). In an accompanying press release issued the same day, and in the report, the Corps stated that it did not intend to temporarily close the O'Brien and Chicago Locks, except intermittently, on a "case by case basis in support of

fish management efforts such as spot piscicide application, or intensive commercial fishing efforts by the * * * USFW and * * * IDNR.” Then, in a letter dated June 8, 2010, General John Peabody, on behalf of the Corps, replied to the May 19, 2010 letter from the Attorneys General of the Plaintiff States. Referring to the conclusion in the Interim III report, General Peabody indicated that only installation of screens in sluice gates would be implemented at this time. The Corps agreed that the issue of potential permanent solutions to the hydrologic connection of the CAWS to the Great Lakes merits a focused study “on an aggressive schedule,” but the Corps did not propose or commit itself to an acceleration of its previously announced schedule, as urged by Plaintiff States. Then, in a press release issued by the ACRCC on June 23, 2010, Colonel Vincent Quarles of the Corps' Chicago District indicated that the Corps would continue routine lock operations.

*13 In sum, Defendants' response to Plaintiffs' requests largely has been that only a low number of individual Asian carp exist above the electric barrier, that there is no evidence that the electric barrier has failed, and that the potential for the establishment of a self-sustaining population in the CAWS above the electric barrier and in Lake Michigan is not imminent in a legal sense and remains unknown based on the characteristics of Asian carp and the Lake Michigan environment. In addition, Defendants maintain that the current intensive inter-agency efforts are comprehensively and satisfactorily addressing the threat posed by Asian carp to the Great Lakes.

II. Analysis

Like all forms of injunctive relief, a preliminary injunction is “an extraordinary remedy that should not be granted unless the movant, *by a clear showing*, carries the burden of persuasion.” *Mazurek v. Armstrong*, 520 U.S. 968, 972, 117 S.Ct. 1865, 138 L.Ed.2d 162 (1997) (emphasis in original); see also *Goodman v. Ill. Dep't of Financial & Professional Reg.*, 430 F.3d 432, 437 (7th Cir.2005) (same). A party seeking a preliminary injunction must demonstrate as a threshold matter that (1) its case has some likelihood of succeeding on the merits; (2) no adequate remedy at law exists; and (3) it will suffer irreparable harm if preliminary relief is denied. *Abbott Labs. v. Mead Johnson & Co.*, 971 F.2d 6, 11 (7th Cir.1992). The Supreme Court recently clarified that, at a minimum, the moving party must “demonstrate that irreparable harm is *likely* in the absence of an injunction,” and that the mere “possibility” of irreparable harm will not suffice. *Winter v. Natural Resources Defense Council*, — U.S. —, — — —, 129 S.Ct. 365, 375–76, 172 L.Ed.2d 249 (2008) (emphasis in original).

If the moving party meets its initial burden, then a court must consider the irreparable harm that the nonmoving party will suffer if preliminary relief is granted, balancing such harm against the irreparable harm that the moving party will suffer if relief is denied. *Storck USA, L.P. v. Farley Candy Co.*, 14 F.3d 311, 314 (7th Cir.1994). The court also considers the public interest served by granting or denying the relief, including the effects of the relief on non-parties. *Id.*; see also *Winter*, 129 S.Ct. at 376–77 (“courts of equity should pay particular regard for the public consequences in employing the extraordinary remedy of injunction”). The court weighs all of these factors, “sitting as would a chancellor in equity” (*Abbott*, 971 F.2d at 12) and applying a “sliding scale” approach, under which “the more likely plaintiff will succeed on the merits, the less the balance of irreparable harms need favor plaintiff’s position” (*Ty, Inc. v. The Jones Group*, 237 F.3d 891, 895 (7th Cir.2001)). As the Seventh Circuit has stressed, “[t]he sliding scale approach is not mathematical in nature, rather ‘it is more properly characterized as subjective and intuitive, one which permits district courts to weigh the competing considerations and mold appropriate relief’ “ *Id* at 895–96 (quoting *Abbott Labs.*, 971 F.2d at 12). Finally, the Supreme Court and the Seventh Circuit consistently have held that mandatory injunctions that compel the enjoined party to act affirmatively, rather than forbear from acting, are even more “cautiously viewed and sparingly issued,” and thus can be justified only upon “the clearest equitable grounds.” *Graham v. Medical Mut. of Ohio*, 130 F.3d 293, 295 (7th Cir.1997); see also *Heckler v. Lopez*, 463 U.S. 1328, 1333–34, 104 S.Ct. 10, 77 L.Ed.2d 1431 (1983); *Jordan v. Wolke*, 593 F.2d 772, 774 (7th Cir.1979); *Harlem Algonquin, LLC v. Canadian Funding Corp.*, 2010 WL 3927698, at *2 (N.D.Ill. Oct.1, 2010).^{FN16}

FN16. Even if a district court decides that the moving party has not satisfied one of the threshold requirements for a preliminary injunction, the court of appeals has urged the district court “to conduct at least a cursory examination” of all of the factors, both to expedite appellate review and to protect the interests of the parties. *Girl Scouts of Manitou Council, Inc. v. Girl Scouts of America, Inc.*, 549 F.2d 1079, 1087 (7th Cir.2008).

A. Likelihood of Success on the Merits

*14 Plaintiffs have pled their claims under two headings: the Administrative Procedure Act and the federal common law of public nuisance. In regard to the latter claim, Plaintiffs contend that Defendants' operation of the structures within the CAWS constitutes a public nuisance, and that the Court has jurisdiction to grant injunctive relief to abate that public nuisance. Defendants contend that Plaintiffs have no likelihood of success on the merits

of their public nuisance and APA claims. As an initial matter, Defendants maintain that the Federal Tort Claims Act (“FTCA”), 28 U.S.C. § 2671 *et seq.*, provides the only waiver of sovereign immunity for tort actions against the United States, and that Plaintiffs cannot proceed under the FTCA because the FTCA provides only for monetary damages, not injunctive relief. In addition, Defendants maintain that Plaintiffs' public nuisance claim fails on its own terms. Finally, to the extent that Plaintiffs have properly invoked the Administrative Procedure Act (“APA”) to seek review of final agency action, Defendants contend that Plaintiffs have failed to show that the Corps has acted contrary to its grants of authority from Congress or in an arbitrary and capricious manner.

1. APA

Under 5 U.S.C. § 702, “[a] person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof.” 5 U.S.C. § 706(1) provides that a court may: “compel agency action unlawfully withheld or unreasonably delayed * * *.” 5 U.S.C. § 706(2) provides, in part, that a court may: “[h]old unlawful and set aside agency actions, findings and conclusions found to be—(a) Arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law * * *.” “Agency action” is defined in 5 U.S.C. § 551(13) to include “the whole or a part of an agency rule, order, license, sanction, relief, or the equivalent or denial thereof, or failure to act * * *.”

Here, Plaintiffs maintain that they have been adversely affected and aggrieved by a number of actions taken by the Corps. Those decisions include: (i) the decision to operate the CAWS in a manner that allows Asian carp to enter Lake Michigan; (ii) the decision of the Corps to rely almost exclusively on the Dispersal Barrier System as its method for precluding Asian carp from entering the Great Lakes despite knowing that the system is of limited effectiveness; (iii) the reopening of the O'Brien Lock and the continued operation of the locks in December 2009 and May 2010; (iv) the denial of relief repeatedly requested by the Plaintiffs in the form of written requests and the prior litigation before the United States Supreme court; and (v) the adoption of the “no change in operation” option described in the Interim III Report, which means that the Corps will continue to reopen the locks without any change in operation to reduce the Asian carp threat.

***15** The Corps contends that the majority of the decisions that Plaintiffs are challenging are beyond the scope of judicial review. In particular, the Corps argues that, with the exception of the adoption of the “no change in operation” option in the Interim III

Report, all of the challenged decisions in this case are non-final and therefore non-reviewable decisions. However, the Corps does not claim that its actions regarding Asian carp are mere recommendations subject to implementation by some superior authority. *Cf. Franklin v. Massachusetts*, 505 U.S. 788, 798, 112 S.Ct. 2767, 120 L.Ed.2d 636 (1992) (census report not reviewable as it was “more like a tentative recommendation than a final and binding determination”); *Dalton v. Spencer*, 511 U.S. 462, 469, 114 S.Ct. 1719, 128 L.Ed.2d 497 (1994) (report not reviewable as it “ ‘carr[ied] no direct consequences’ for base closures.”). In fact, Plaintiffs are challenging tangible, physical actions that the Corps has taken and continues to take. In particular, Plaintiffs challenge the conditions under which the Corps is operating the CAWS lock and dam system because, Plaintiffs contend, the Corps’ actions have created and maintained a pathway for Asian carp to migrate into the Great Lakes. At least in assessing whether Plaintiffs have some likelihood of success on the merits in a preliminary injunction motion, the Court cannot conclude that the Corps’ actions in this case do not carry real and direct consequences to the Great Lakes.

However, even assuming that Plaintiffs clear the reviewability hurdle, they have a minimal chance of success on the merits of their APA claims. As to several of the challenged decisions—in particular, (i) through (iv) listed above—the evidence does not support the view that the Corps’ actions were wrong at all, much less arbitrary and capricious. In fact, there is no evidence that Asian carp have entered Lake Michigan through the CAWS, that the barrier system has not operated with reasonable effectiveness, or that the operation of the O’Brien Lock has adversely affected Plaintiff’s interests.

Plaintiffs also take issue with the risk assessment conducted for Interim III and claim that the Corps “ignor[ed]” the eDNA evidence and manipulated the scientific results by not requesting the experts’ opinions on permanent closure of the locks. Defendants contend that Plaintiffs’ real disagreement is the conclusion the Corps drew from the scientific evidence found in the USFWS’s risk assessment, not with the evidence itself. As Defendants note, the fact that Plaintiffs draw a different conclusion from the science does not equate to an arbitrary and capricious finding. Even though another authority or decisionmaker may have chosen a different course, if the “agency’s reasons and policy choices * * * conform to ‘certain minimal standards of rationality’ * * * the rule is reasonable and must be upheld.” *Small Refiner Lead Phase–Down Task Force v. EPA*, 705 F.2d 506, 521 (D.C.Cir.1983); see also *Israel v. U.S. Dep’t. of Agric.*, 282 F.3d 521, 526 (7th Cir.2002) (“The arbitrary and capricious standard is highly deferential, and even if we

disagree with an agency's action, we must uphold the action if the agency considered all of the relevant factors and we can discern a rational basis for the agency's choice.”) (internal citations omitted).

*16 Plaintiffs' contentions in regard to the Interim III study are colorable; yet, on the record compiled before the Court at this time, the Court concludes that Plaintiffs are not likely to succeed on a claim that it was irrational to exclude from the expert survey the option to permanently close the locks—particularly in view of the statutory mandate to operate the locks and the concern expressed by witnesses at the hearing that taking any such action would require express Congressional authorization. The Corps need not have investigated every conceivable option in order to have acted rationally. Similarly, given the limitations of eDNA evidence revealed at the hearing—including limitations recognized by Dr. Lodge and the proponents of his testimony—Plaintiffs are not likely to be able to convincingly show that the Corps acted irrationally in viewing the eDNA evidence with at least some skepticism. The Corps' treatment of the eDNA data is all the more understandable in view of the facts that (1) the Corps asked Dr. Lodge to get involved in eDNA testing in the first place, (2) it is well aware of improvements that Dr. Lodge and his team have undertaken over time in regard to their testing, and (3) it also is aware that a peer reviewed study of Dr. Lodge's work is underway that may shed additional light on the reliability of that work.

In sum, while the Court does not conclude that Plaintiffs have no chance of success on the merits on any of their APA claims, Plaintiffs' showing on those claims at this stage of the case is minimal. Accordingly, Plaintiffs will need a very strong showing on the other elements to be entitled to preliminary injunctive relief on their APA claims.

2. Public Nuisance

a. Waiver of sovereign immunity

At common law, a condition, action, or failure to act that unreasonably interferes with a right common to the general public is a public nuisance. Defendants correctly point out that a nuisance action generally is considered a tort. See RESTATEMENT (SECOND) OF TORTS § 821B (1979) (“A public nuisance is an unreasonable interference with a right common to the general public”). Defendants maintain that the FTCA provides the exclusive scheme for compensating persons injured by the torts of the federal govern-

ment and that the FTCA limits recovery against the United States to money damages. See *United States v. Smith*, 499 U.S. 160, 163, 111 S.Ct. 1180, 113 L.Ed.2d 134 (1991); see generally *Duffy v. United States*, 966 F.2d 307, 313 (7th Cir.1992). From these basic principles, Defendants contend that the availability of remedies under the FTCA precludes this Court from exercising jurisdiction over any freestanding cause of action based on the federal common law of nuisance.

Plaintiffs posit that any immunity of the Corps to such an action seeking injunctive relief has been waived by Congress. See 5 U.S.C. § 702. In 1976, Congress amended § 702 to remove the defense of sovereign immunity as a bar to judicial review of federal administrative action that is otherwise subject to judicial review.^{FN17} According to the pertinent legislative history, the “clear purpose” of the waiver was to eliminate the sovereign immunity defense “in *all* equitable actions for specific relief against a Federal agency.” See *Trudeau v. Federal Trade Comm.*, 456 F.3d 178, 186 (D.C.Cir.2006) (emphasis in original) (quoting S.Rep. No. 94–996, at 8 (1976) and H.R.Rep. No. 94–1656, at 9 (1976)); see also *Sea–Land Serv., Inc. v. Alaska R.R.*, 659 F.2d 243, 244 (D.C.Cir.1981). Several circuits have reached the same conclusion about the breadth of the § 702 waiver. See *Raz v. Lee*, 343 F.3d 936, 938 (8th Cir.2003) (§ 702 “expressly waives sovereign immunity as to any action for nonmonetary relief brought against the United States”); *United States v. City of Detroit*, 329 F.3d 515, 520 (6th Cir.2003) (*en banc*) (under § 702 of the APA the government “has waived its immunity with respect to non-monetary claims”); *The Presbyterian Church (U.S.A.) v. United States*, 870 F.2d 518, 525 (9th Cir.1989) (“the 1976 amendment to § 702 waives sovereign immunity in all actions seeking relief from official misconduct except for money damages”). The Seventh Circuit, too, has recognized that Congress has “waived sovereign immunity for most forms of prospective relief.” *Blagojevich v. Gates*, 519 F.3d 370, 371 (2008).

FN17. Section 702 provides:

A person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof. An action in a court of the United States seeking relief other than money damages and stating a claim that an agency or an officer or employee thereof acted or failed to act in an official capacity or under color of legal authority shall not be dismissed nor relief therein be denied on the ground that it is against the United States or that the United States is an indispensable

party. The United States may be named as a defendant in any such action, and a judgment or decree may be entered against the United States: *Provided*, That any mandatory or injunctive decree shall specify the Federal officer or officers (by name or by title), and their successors in office, personally responsible for compliance. Nothing herein (1) affects other limitations on judicial review or the power or duty of the court to dismiss any action or deny relief on any other appropriate legal or equitable ground; or (2) confers authority to grant relief if any other statute that grants consent to suit expressly or impliedly forbids the relief which is sought.

5 U.S.C. § 702

*17 This waiver goes beyond matters reviewable through the APA— § 702 is “a law of general application.” *Blagojevich*, 519 F.3d at 372; see also *City of Detroit*, 329 F.3d at 521 (noting that each of the five other circuits “that have addressed this issue agree that ‘the waiver of sovereign immunity contained in § 702 is not limited to suits brought under the APA’ ”). The waiver also appears to go beyond particular statutes, reaching civil matters arising under the “laws” of the United States. *Trudeau*, 456 F.3d at 185 (quoting 28 U.S.C. § 1331) (concluding that the APA’s § 702 “waiver of sovereign immunity permits not only Trudeau’s APA cause of action, but his nonstatutory and First Amendment actions as well.”). The “laws” of the United States include the federal common law of public nuisance. See *Illinois v. City of Milwaukee*, 406 U.S. 91, 99–100, 92 S.Ct. 1385, 31 L.Ed.2d 712 (1972) (applying 28 U.S.C. § 1331)^{FN18}; see also *Arkansas v. Oklahoma*, 503 U.S. 91, 112 S.Ct. 1046, 117 L.Ed.2d 239 (1992) (discussing generally the federal common law of nuisance). Thus, Plaintiffs contend that, notwithstanding the FTCA’s silence on the issue of injunctive relief, the unequivocal breadth of the sovereign immunity waiver in § 702 (and the case law construing it) squarely encompasses within it Plaintiffs’ common law claim seeking non-monetary relief to abate a public nuisance.

FN18. Comprehensive amendments to the Federal Water Pollution Control Act (“FWCPA”) preempted the common law nuisance in the area of water pollution (at issue in *Illinois v. City of Milwaukee*) (see *Middlesex Cty. Sewerage Auth. v. National Sea Clammers Ass’n.*, 453 U.S. 1, 21–22, 101 S.Ct. 2615, 69 L.Ed.2d 435 (1981)); however, as addressed below, no such legislation exists with regard to the subject of Plaintiffs’ suit.

Neither party has cited any controlling authority addressing the interplay between the FTCA and § 702. Although Plaintiffs have not cited (nor has the Court found) a case in which § 702 was used to waive sovereign immunity for a federal common law nuisance claim, the Court is not entirely convinced by Defendants' argument. Both sides agree that the § 702 waiver applies unless another statute expressly displaces it. *Blagojevich*, 519 F.3d at 372. Building on this principle, Defendants contend that Plaintiffs' public nuisance claim "is properly brought as a tort" (although Plaintiffs have not "styled" it as such) and that the FTCA, enacted in 1948, impliedly forbids injunctive relief against the United States for common law tort claims. Thus, Defendants contend, § 702 cannot be used to circumvent the FTCA's limited waiver of sovereign immunity.^{FN19} But Defendants' argument can be viewed another way—that the FTCA is the exclusive remedy for torts committed by government employees when the party seeking relief is requesting *money damages*, but if a party seeks non-monetary relief, then it may proceed under the APA (and its broader waiver of sovereign immunity, including as to injunctive relief). Furthermore, Defendants' interpretation does not square with the recent court of appeals decisions cited above, which have construed the § 702 waiver to be extremely broad (and perhaps unlimited).

FN19. At oral argument, defense counsel presented the Court with two court cases in which district courts have held that the FTCA provides the waiver of sovereign immunity for all tort claims, including claims for public nuisance. See *Miccosukee Tribe of Indians of Fla. v. U.S. Army Corps of Eng'rs*, Case No. 02–CV–22778, Slip Op. at 11, n. 5 (S.D.Fl.2003); *United States v. Olin Corporation*, 606 F.Supp. 1301, 1312 (N.D.Ala.1985). Having reviewed those cases, the Court respectfully notes that neither case delved into the issue in sufficient detail to allay the Court's skepticism regarding Defendants' position. For instance, the court in *Miccosukee* did not refer to § 702's waiver of sovereign immunity, while the decision in *Olin* was issued several years before the recent decisions discussing the breadth of the § 702 waiver and did not address the argument that while the FTCA provides the exclusive jurisdiction for tort claims seeking monetary relief, the APA and § 1331 may provide the basis for federal claims seeking non-monetary relief.

In view of those decisions, the Court is wary of reading into § 702 an implicit tort exception to the broad waiver of sovereign immunity, particularly when Congress has had more than thirty years since § 702 was amended to explicitly exempt all tort claims from the scope of the § 702 waiver if that was (or is) its intent. Given the dearth of relevant

authority and the uncertainty as to the proper disposition of this issue, the Court cannot place the likelihood of success on the merits of the public nuisance claim at zero, as Defendants urge the Court to do.

*18 Moreover, given the current posture of the case, the Court need not offer a definitive view on the difficult legal issue presented by the interplay between § 702 and the FTCA. If Defendants are correct that (1) a public nuisance action sounds in tort and (2) the FTCA bars a tort suit for injunctive relief against a federal agency, then Plaintiffs cannot show any likelihood of success on the merits of their common law nuisance claim. However, if Plaintiffs are correct that the § 702 waiver of sovereign immunity encompasses a public nuisance claim, then the question is whether a preliminary injunction should issue under the “sliding scale” test. In that regard, the most significant issues now before the Court are how strong a showing Plaintiffs have made on the likelihood of success on the merits and whether (and to what extent) Plaintiffs can show a likelihood of irreparable harm; if they cannot marshal a sufficiently strong showing as to those elements, they will not be entitled to preliminary relief in any event.

b. Displacement

Before turning to the merits, however, the Court must address Defendants' contentions that (1) existing federal statutes displace Plaintiffs' federal common law nuisance action and (2) Plaintiffs' claim conflicts with federal law and policy. According to Defendants, even if a federal common law nuisance claim might otherwise exist, any such cause of action has been displaced by federal legislation.

A cause of action has been displaced when federal statutory law governs a question previously the subject of federal common law. See *Connecticut v. American Elec. Power Co., Inc.*, 582 F.3d 309, 371 (2d Cir.2009) (“AEP”) (citing *Milwaukee v. Illinois*, 451 U.S. 304, 316, 101 S.Ct. 1784, 68 L.Ed.2d 114 (1981) (“*Milwaukee II*”)). The displacement standards as they apply to water pollution nuisance cases are well-described by the Second Circuit in *AEP*:

Because federal common law is subject to the paramount authority of Congress, federal courts may resort to it only in absence of an applicable Act of Congress. Federal common law is a necessary expedient to which federal courts may turn when compelled to consider federal questions which cannot be answered from federal statutes alone. But when Congress addresses a question previously governed by a decision rested on

federal common law the need for * * * lawmaking by federal courts disappears. The question [of] whether a previously available federal common-law action has been displaced by federal statutory law involves an assessment of the scope of the legislation and whether the scheme established by Congress addresses the problem formerly governed by federal common law.

Id. at 371 (quotations and internal citations to *Milwaukee II* omitted). The Supreme Court has stressed that “[s]tatutes which invade the common law * * * are to be read with a presumption favoring the retention of long-established and familiar principles, except when a statutory purpose to the contrary is evident.” *United States v. Texas*, 507 U.S. 529, 534, 113 S.Ct. 1631, 123 L.Ed.2d 245 (1993) (internal quotation marks omitted). “[C]ourts may take it as a given that Congress has legislated with an expectation that the common law principle will apply except when a statutory purpose to the contrary is evident.” *Id.*

*19 In *Milwaukee I*, the Supreme Court upheld the right of Illinois to sue the City of Milwaukee in a federal common law public nuisance action relating to overflow discharges of untreated sewage into Lake Michigan, despite the existence of several existing and new federal laws giving federal agencies the authority to control water pollution. The Court stated, “[u]ntil the field has been made the subject of comprehensive legislation or authorized administrative standards, only a federal common law basis can provide an adequate means for dealing with such claims as alleged federal rights.” *Illinois v. Milwaukee*, 406 U.S. 91, 103, 92 S.Ct. 1385, 31 L.Ed.2d 712 (1972). Thus, if the extant statutes governing the subject matter do not cover a plaintiff's claims and provide a remedy, a plaintiff may bring its claim under the federal common law of nuisance and need not feel “obliged to await the fashioning of a comprehensive approach to domestic water pollution before it can bring an action to invoke the remedy it seeks.” *AEP*, 582 F.3d at 330.

The standards for displacement of federal common law were further clarified in *Milwaukee II* and subsequent cases. In *Milwaukee II*, the Supreme Court held that the new Federal Water Pollution Control Act Amendments of 1972 met the standard for displacement of federal common law nuisance to address the pollution at issue in that case because “Congress' intent in enacting the Amendments were clearly to establish an all encompassing program of water pollution regulation. Every point source discharge is prohibited unless covered by a permit, which directly subjects the discharger to the ad-

ministrative apparatus established by Congress to achieve its goals.” *Milwaukee II*, 451 U.S. at 318. “The establishment of such a self-consciously comprehensive program by Congress, which certainly did not exist when *Illinois v. Milwaukee* was decided, strongly suggests that there is no room for courts to attempt to improve on that program with federal common law.” *Id.* at 319. Federal common law applies unless and until “the field has been the subject of comprehensive legislation or authorized administrative standards.” *Id.* at 314.

Apparent comprehensiveness of Congressional legislation is only one indication of displacement. While there appeared to be comprehensive legislation on the subject of water pollution in *Milwaukee I*, for there to be displacement, the comprehensive legislation also must address the problem at issue and do so specifically to displace the common law. The question whether a previously available federal common-law action has been displaced by federal statutory law thus “involves an assessment of the scope of the legislation and whether the scheme established by Congress addresses the problem formerly governed by federal common law.” *Milwaukee II*, 451 U.S. at 315, n. 8. Even when a federal “Act does not address every issue * * * when it does speak directly to a question, the courts are not free to ‘supplement’ Congress’ answer so thoroughly that the Act becomes meaningless.” *Id.* “Thus the question was whether the legislative scheme ‘spoke directly to a question’ * * * not whether Congress had affirmatively proscribed the use of federal common law.” *Id.* In other words, “[t]he displacement question requires courts to distinguish between situations in which regulatory coverage leaves a ‘gap’ which federal common law can appropriately fill, and situations in which the federal common law overlaps with an existing regulatory scheme but would supply a different approach than the one Congress has mandated .” *AEP*, 582 F.3d at 374.

***20** At present, this is a *Milwaukee I* case, not a *Milwaukee II* case. The federal statutes cited by Defendants and the City as having purportedly displaced federal common law do not comprehensively and specifically address the threat of an Asian carp invasion of Lake Michigan through the CAWS to the degree found in *Milwaukee II*, nor do they provide a specific mandate or methods for adequately addressing the threat. For instance, the only specific statutory provision relating to aquatic nuisance species in the CAWS cited by Defendants as a ground for displacement of federal common law is 16 U.S.C. § 4722(i)(3). Enacted in 1996, it authorized a “Dispersal barrier demonstration” project to impede the dispersal of aquatic nuisance species (such as zebra mussels and round goby) in the Great Lakes through the CAWS into the Mississippi River basin, and

ultimately led to the operation, beginning in 2002, of what the Corps now refers to as “Barrier I.” It is not a comprehensive program for preventing Asian carp introduction and establishment in the Great Lakes. Nor do the other laws cited by Defendants and the City, either individually or together, constitute the kind of all-encompassing scheme that would satisfy *Milwaukee II*.^{FN20}

FN20. It remains to be seen whether the recent appointment of federal Asian Carp Czar John Goss and proposed (or future) federal legislation to deal with the Asian carp issue will result in a more comprehensive statutory and regulatory approach akin to the Clean Water Act. At this time, however, no such regime exists.

In sum, in assessing whether Plaintiffs' have some likelihood of success on the merits at this stage of the case, the Court is unwilling to conclude, as Defendants and Intervenor urge, that the extant statutes relating to the subject matter at hand cover Plaintiffs' claims and provide an adequate remedy to Plaintiffs. Those statutes simply do not approach the level of comprehensiveness, specificity, and all-inclusiveness found by the Supreme Court to have displaced the common law nuisance action, as in *Milwaukee II*.

c. Merits

Because the Court is not convinced either that (1) sovereign immunity or (2) a comprehensive federal scheme bars Plaintiffs' federal common law public nuisance claim altogether, the Court must consider the extent to which Plaintiffs have shown a likelihood of success on the merits of their claim that Defendants' maintenance and operation of the CAWS infrastructure creates an unreasonable interference with a common public right. As explained below, as the analysis shifts from the threshold non-merits issues discussed above to the likelihood of success on the merits of Plaintiffs' public nuisance claim, the Court's skepticism shifts from Defendants' arguments to Plaintiffs'.

Plaintiffs spend little time discussing the prospects for ultimate success on their federal common law nuisance claim, suggesting that only a bare showing is needed given that the irreparable and public harms weigh significantly in their favor. Although the Seventh Circuit applies a sliding scale approach, Plaintiffs nevertheless must show some likelihood of success on the merits. See *Abbott Laboratories*, 971 F.2d at 11–12. Generally, interference with a public right is unreasonable if the conduct: (1) involves interference with public health, safety, peace, comfort, or convenience; (2) is proscribed by statute, ordinance, or administrative regulation; or (3) is of a continuing nature or has

produced a permanent or long-lasting effect upon the public right. See RESTATEMENT (SECOND) OF TORTS § 821B(1). “The elements of a claim based on the federal common law of nuisance are simply that the defendant is carrying on an activity that is causing an injury or significant threat of injury to some cognizable interest of the complainant.” *Illinois v. Milwaukee*, 599 F.2d 151, 165 (7th Cir.1979) (overruled on other grounds).

***21** The waters and aquatic resources of Lake Michigan and the other Great Lakes are held in trust for the benefit of the public by all of the Great Lakes states—both Plaintiffs and non-plaintiffs—within their respective jurisdictions. The public rights in those waters and resources include, but are not limited to, fishing, boating, commerce, and recreation. Plaintiffs contend that the migration of bighead and silver carp from the CAWS into Lake Michigan, and thereby into other Great Lakes and connected rivers and bodies of water, will cause irreversible harm to the common public rights in those waters. Plaintiffs further contend that operating the CAWS infrastructure in a way that permits this migration interferes with public safety, health, comfort and convenience because, if established in the Great Lakes, Asian carp could cause physical injury to boaters and drive out native fish species sought by sport and commercial fishers. Likewise, Plaintiffs maintain that facilitating the introduction of aquatic invasive species such as Asian carp contravenes federal policies delineated in the Nonindigenous Aquatic Nuisance Prevention and Control Act and the Lacey Act.

In evaluating the likelihood of success on this claim, the Court first must consider the strength of the evidence adduced to date that would support the existence of a nuisance at this time, as opposed to a potential nuisance at some time in the future. It is at least arguable that if Asian carp were to establish a reproducing population in the Great Lakes, that population could produce “a permanent and long-lasting effect.” In fact, the Corps' own statements confirm that they are aware of such a possibility. However, at this point, based on the evidence before the Court, that possibility is too remote to conclude that Plaintiffs have set forth a strong likelihood of success on the merits.

As noted above, the public nuisance tort prevents only “unreasonable” interference with a public right, and each of its prongs contemplates an active—or, at least, an imminent—threat of injury. See *Illinois*, 599 F.2d at 165; RESTATEMENT (SECOND) OF TORTS § 821B(1). At best, Plaintiffs have shown that Defendants' actions (or inactions) conceivably could satisfy one or more of the Restatement tests *if* the evidence showed an actual, ongoing injury or imminent threat of injury to the water and aquatic resources of

Lake Michigan and the other Great Lakes. But, as discussed in much greater detail below (in the “harm” section), the evidence does not support the existence today (or even in the short-term future) of any unreasonable nuisance as a result of Defendants' actions or inactions in maintaining and operating the CAWS. Even giving every benefit of the doubt to the supportable inferences that can be drawn from Dr. Lodge's testimony, the current evidence shows that (1) only one Asian carp has been discovered above the barrier; (2) at most, crediting the eDNA testing, only a small number of individual Asian carp exist above the electric barrier; (3) there is no basis for concluding that the electric barrier has been breached at all, much less in any significant way; (4) the closest known population of Asian carp in any significant numbers is in either the Brandon Road pool (south of Joliet), or more likely, in the Dresden Island pool (near Morris, many miles below the barrier); (5) the best estimate of the location of any juvenile (or “young of year”) Asian carp is even further downstream in the Marseilles area; and (6) the potential for the establishment of a self-sustaining population in the CAWS above the electric barrier or in Lake Michigan remains an unknown. In view of the foregoing, Plaintiffs have demonstrated, at best, a very modest likelihood of success on their public nuisance claim.^{FN21}

FN21. As explained below, the same evidence also dooms Plaintiffs' showing of irreparable harm; in short, Plaintiffs' case at the preliminary injunction stage falls short both on the merits and irreparable harm.

***22** The Court hastens to add that even if the evidence pointed more convincingly to an existing (or imminent) threat of injury, Plaintiffs still would be required to clear another hurdle—namely, the traditional reluctance of courts “to enjoin as a public nuisance activities which have been considered and specifically authorized by the government.” *New England Legal Found. v. Costle*, 666 F.2d 30, 33 (2d Cir.1981). A recent Fourth Circuit decision in which the court of appeals reversed a district court's decision to enter a mandatory injunction premised on a public nuisance tort theory is highly instructive on that point.

In that case, *State of North Carolina v. Tennessee Valley Authority*, 615 F.3d 291 (4th Cir.2010), the district court's injunction required a federal agency, the Tennessee Valley Authority, to immediately install emissions controls at four electricity-generating plants that would have cost consumers an estimated \$1 billion. The case arose out of the State of North Carolina's dissatisfaction with the air quality standards authorized by Congress, established by the United States EPA, and implemented through state permits. In the

lawsuit, North Carolina essentially requested that the federal courts impose a different set of standards. *Id.* at 310–11. Here, by analogy, Plaintiffs have expressed dissatisfaction with the measures being implemented to address the potential for Asian carp migration into the CAWS and ultimately the Great Lakes by the Corps and other federal, state, and local agencies and entities that have been authorized to manage and operate the CAWS. As in the *TVA* case, the parties to the litigation agree on the end—in that case, “the desirability of reducing air pollution” (*id.* at 298); here, preventing the establishment of a self-sustaining population of Asian carp in Lake Michigan—but dispute the “most effective means” to that end (*id.*). To be sure, the rules and regulations at issue in *TVA* were more comprehensive (and specific) than those at issue here (aside from § 126, which appears to confer very broad, though temporary, authority on the Corps). Nevertheless, as explained in greater detail below, the Fourth Circuit’s opinion raises a number of concerns that bear on the peculiar issues raised by a public nuisance challenge to a complex environmental problem as to which Congress and federal agencies have spoken in some fashion.

In vacating the injunction, the *TVA* court questioned how an activity expressly permitted and extensively regulated by both federal and state government somehow could constitute a public nuisance. 615 F.3d at 296. The court characterized public nuisance as “an ill-defined omnibus tort of last resort” and further observed that “while public nuisance law doubtless encompasses environmental concerns, it does so at such a level of generality as to provide almost no standard of application.” 615 F.3d at 302. Although the court recognized that the district court imposed an injunction in a “well-meaning attempt to reduce air pollution” (*id.* at 298), it raised a number of concerns centered on the “agency and judicial roles in addressing the problem of air pollution” (*id.* at 304), questioning among other things “whether expert witnesses in bench trials can replicate the sources that EPA can bring to bear” (*id.*) and expressing serious doubt “that Congress thought that a judge holding a twelve-day bench trial could evaluate more than a mere fraction of the information that regulatory bodies can consider” (*id.* at 305).

***23** In view of the differences between the statutory and regulatory scheme at issue in *TVA* and the regime currently in place to contend with the Asian carp problem, the Court acknowledges that care must be taken in attempting to extrapolate from one case to the other. At the same time, however, the Fourth Circuit’s teaching that “courts in this highly technical arena respect [should] respect the strengths of the agency processes on which Congress has placed its imprimatur” remains relevant. *TVA*, 615 F.3d at 305–06.

In that regard, it is worth noting that the action that Plaintiffs challenge here—operation of the CAWS structures to provide for navigation and flood control and water diversion—is Congressionally authorized and extensively controlled and regulated by the Corps and other agencies. The Corps operates the facilities in the CAWS pursuant to the statutes authorizing the works and regulating their uses. Similarly, the Corps operates and maintains the CSSC as necessary to sustain navigation from Chicago Harbor on Lake Michigan to Lockport on the Des Plaines River. See, e.g., Act of Dec. 4, 1981, Pub.L. No. 97–88, § 107, 95 Stat. 1135 (CSSC to be operated “in the interest of navigation”); Act of July 30, 1983, Tit. I, Ch. IV, 97 Stat. 301 (Chicago Lock); River and Harbors Act of 1946, Pub.L. No. 79–525, 60 Stat. 634 (July 24, 1946) (same, for O'Brien lock). Congress has specified in the Aquatic Nuisance Prevention Act that, to the extent the agency finds feasible, efforts to combat aquatic nuisance species are to be “incorporated” into the “ongoing operations” of the canal. See 16 U.S.C. 4722(i)(3)(A) and (B)(ii). And in Section 126, Congress has conferred on the Secretary of the Army even broader—albeit temporary—authority to undertake whatever “modifications or emergency measures as [he] determines to be appropriate” to combat Asian carp from bypassing the electric barrier and dispersing into the Great Lakes. Finally, it is readily apparent from the executive and legislative activity in the few months since this lawsuit was commenced that the White House and Congress have focused their attention on the Asian carp issue and that further federal (and coordinated state, federal, and international) initiatives are under consideration.

The backdrop of these statutory and regulatory structures—some long standing, others recently enacted (and extended), and still others contemplated—provides relevant context for Plaintiffs' federal common law public nuisance claim. Consistent with the Fourth Circuit's views in *TVA*, other circuits have observed that “[c]ourts traditionally have been reluctant to enjoin as a public nuisance activities which have been considered and specifically authorized by the government.” *Costle*, 666 F.2d at 33. This is especially true “where the conduct sought to be enjoined implicates the technically complex area of environmental law.” *Id.*; see also RESTATEMENT (SECOND) OF TORTS § 821B cmt. F. (“Although it would be a nuisance at common law, conduct that is fully authorized by statute, ordinance or administrative regulation does not subject the actor to tort liability.”).

***24** These principles would make it difficult to conclude that the Corps has created a public nuisance by acting in accordance with its statutory mandates, even if Plaintiffs had

presented stronger evidence of a current or imminent injury to the waters and aquatic resources of Lake Michigan and the Great Lakes. And it would be equally difficult to conceive of the “all-purpose” public nuisance tort as an appropriate vehicle for the imposition of mandatory injunctive relief that would substitute the Court's views of an appropriate plan of action for Defendants' judgment on the basis of the balancing of competing interests and concerns at issue in the management and operation of the CAWS. Any court-ordered relief along the lines requested by Plaintiffs very likely would affect lock operations, lake-water diversion, water quality, navigation, flood control, and of course isolating, capturing, or killing Asian carp. All of these matters already are addressed, at least in some fashion, by existing statutes, regulations, rules, ordinances, and/or management policies, and remain subject to additional measures that may be imposed by Congress and/or the Asian Carp Director.^{FN22}

FN22. None of this discussion of the *TVA* and *Costle* cases is meant to suggest that the federal common law tort of public nuisance is preempted by any of the existing laws that pertain to the management and operation of the CAWS or the authority of the Corps to deal with the Asian carp problem. Nor should this discussion be viewed as suggesting that a public nuisance claim against a federal agency can never succeed. Nevertheless, the concerns identified by the Fourth Circuit in *TVA* and the Second Circuit in *Costle* are significant, and any plaintiff seeking mandatory injunctive relief against a federal agency in circumstances like those present in those cases (and this one) must come to grips with those concerns.

B. Imminent, Irreparable Harm

Under the sliding scale, given the very modest showing in regard to likelihood of success on the merits of their claims discussed above, Plaintiffs cannot prevail absent a strong showing that the extraordinary, mandatory injunctive relief that they seek is necessary to prevent irreparable harm from occurring. As demonstrated during the September 7–10, 2010, hearing, the Federal Defendant (in conjunction with its state and federal partners on the Asian Carp Regional Coordinating Committee (“ACRCC”)) has concluded that (1) only a small number of individual Asian carp exist above the electric barrier; (2) there is no evidence that the electric barrier has failed; and (3) the potential for the establishment of a self-sustaining population in the CAWS above the electric barrier or in Lake Michigan is not imminent in a legal sense and remains an unknown based on the characteristics of these fish. In challenging those conclusions, Plaintiffs maintain that

the situation is at a “critical juncture” that merits the extraordinary relief they seek and that the current intensive inter-agency efforts, which even Plaintiffs acknowledge are unusual in their scope, are not properly addressing the threat posed by Asian carp to the Great Lakes.

Plaintiffs' claim of imminent irreparable harm relies heavily on the conclusions that they draw from positive eDNA results above the electric barrier coupled with the discovery of a single live fish in Lake Calumet and one dead fish found south of the barrier (near Lockport) in the December 2009 rotenone event. See generally Testimony of Dr. David Lodge. This evidence must demonstrate that Plaintiffs have carried their burden “that irreparable injury is likely”—not just possible—“in the absence of an injunction.” *Winter v. NRDC*, — U.S. —, — – —, 129 S.Ct. 365, 374–375, 172 L.Ed.2d 249 (2008). Based on this evidence, Plaintiffs argue that the electric barrier must have failed, and because the locks remain open to water traffic, Asian carp can migrate into Lake Michigan and establish a breeding population in the Lake.

***25** Because so much of Plaintiffs' case on irreparable harm turns on the opinion testimony of Dr. Lodge—and, to a lesser degree, Dr. Newcomb—the Court first will address the challenges to the admissibility of those witnesses' testimony.^{FN23} Federal Rule of Evidence 702 and the Supreme Court's decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993), provide the legal framework for the admissibility of opinion (or expert) testimony. See *United States v. Pansier*, 576 F.3d 726, 737 (7th Cir.2009). In assessing a motion to exclude testimony under Rule 702, the Court considers whether the proposed opinion witness (1) is qualified to offer opinion testimony under Rule 702, (2) has employed a reliable methodology, (3) proposes to offer opinions that follow rationally from the application of his “knowledge, skill, experience, training, or education,” and (4) presents testimony on a matter that is relevant to the case at hand, and thus helpful to the trier of fact. See *Kumho Tire*, 526 U.S. at 151–53; *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997); *Daubert*, 509 U.S. at 589–93; see also *Walker v. Soo Line R.R. Co.*, 208 F.3d 581, 586 (7th Cir.2000). “The proponent of the expert bears the burden of demonstrating that the expert's testimony would satisfy the *Daubert* standard.” *Lewis v. CITGO Petroleum Corp.*, 561 F.3d 698, 705 (7th Cir.2009).

FN23. Although neither Plaintiffs nor Defendants have asserted a *Daubert* challenge at this stage of the case, Intervenor Wendella Sightseeing Company has

moved to strike the testimony of Dr. Tammy Newcomb [71], and Intervenor Coalition to Save Our Waterway has moved to strike the testimony of Dr. David Lodge [107].

Daubert lists a number of relevant considerations in evaluating an expert's reasoning and methodology—including testing, peer review, error rates, and acceptability in the relevant scientific community. *Daubert* at 593–94. “[T]he test of reliability is flexible,” however, “and *Daubert*'s list of specific factors neither necessarily nor exclusively applies to all experts or in every case.” *Kumho*, 526 U.S. at 141 (internal quotation omitted). “Rather the law grants a district court the same broad latitude when it decides how to determine reliability as it enjoys in respect to its ultimate reliability determination.” *Id.* at 142 (emphasis omitted).

Rule 702 requires that the district court act as a “ ‘gatekeeper’ who determines whether proffered expert testimony is reliable and relevant before accepting a witness as an expert.” *Winters v. Fru-Con Inc.*, 498 F.3d 734, 741–42 (7th Cir.2007) (quoting *Autotech Tech. Ltd. P'ship v. Automationdirect.com*, 471 F.3d 745, 749 (7th Cir.2006)); see also *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 147–49, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999); *Daubert*, 509 U.S. at 589. The Seventh Circuit “gives the [district] court great latitude in determining not only how to measure the reliability of the proposed expert testimony but also whether the testimony is, in fact, reliable.” *Pansier*, 576 F.3d at 737 (emphasis omitted) (citing *Jenkins v. Bartlett*, 487 f.3d 482, 489) (7th Cir.2007); see also *Lewis*, 561 F.3d at 704–05 (“the law grants the district court great discretion regarding the manner in which it conducts that [*Daubert*] evaluation”); *Gen. Elec. Co.*, 522 U.S. at 141–43 (holding that abuse of discretion standard applies in reviewing district court rulings on admissibility of proposed Rule 702 opinion testimony). The court of appeals also has stressed that when “the gatekeeper and the factfinder are one and the same”—as is the case in a bench trial or a preliminary injunction hearing—the district court may provisionally admit the evidence, “subject to the ability later to exclude it or disregard it if it turns out not to meet the standard of reliability established by Rule 702.” *In re Salem*, 465 F.3d 767, 777 (7th Cir.2006).

***26** Here, certain Intervenor–Defendants have mounted a sustained attack on the testimony of both Dr. Lodge and Dr. Newcomb. The gist of the criticism of Dr. Lodge centers on the methods that he used in carrying out his eDNA testing. In particular, the critics of Dr. Lodge point to (i) the novelty of eDNA testing in general, (ii) the inability of Dr.

Lodge to identify “false positives,” (iii) the omission of certain additional studies or tests that might have confirmed his results, such as a calibration study or additional sequencing on his samples, and (iv) the refusal of Dr. Lodge to provide his samples or data to experts or consultants for Defendants–Intervenors so that they could try to verify his work. The general criticism of Dr. Newcomb's work is even more basic: according to Intervenor–Defendants, Dr. Newcomb did nothing more than summarize the research and reports of others—conducting no original work of her own—and state her findings in an affidavit.

Plaintiffs (and, indeed, Dr. Lodge himself) have acknowledged certain limitations of the eDNA methodology as Dr. Lodge has employed it. For example, they recognize that one cannot determine on the basis of a positive test result how many fish may be in the vicinity—or even conclusively that the DNA indicates the presence of a fish (as opposed to, for example, bird excrement containing traces of fish DNA) that caused the positive result. Plaintiffs also appear to concede that a calibration study could have been done and that sequencing was done on some, but not all, of the samples. But Plaintiffs maintain that even if Dr. Lodge's work was not perfect and does not provide all of the answers—and in fact has not yet been published or peer reviewed—it is sufficiently well developed, reported, and reliable to be tested by others and to be considered by the Court in this proceeding. Plaintiffs also properly note that (1) the Corps initiated the contact with Dr. Lodge to launch the eDNA work, (2) the Corps has found that work sufficiently reliable to consider it in making operational decisions, and (3) some of the witnesses for the defense—notably, Mr. Chapman—have concurred in some of Dr. Lodge's key findings.

Consistent with the Seventh Circuit's guidance for non-jury proceedings and in the interest of expediting the hearing and consideration of the issues, the Court provisionally accepted Dr. Lodge's (and Dr. Newcomb's) written and oral testimony, with the caveat that the testimony could be disregarded or excluded if upon reflection it proved irrelevant or inadmissible. Upon further consideration of all of the arguments, the Court concludes that the criticisms of Dr. Lodge's testimony go more to weight than the admissibility, and thus the Court will consider Dr. Lodge's opinions to the extent that they bear on issues of consequence at this stage of the case. The decision to consider Dr. Lodge's testimony is bolstered by the fact that his opinions were subject to extensive cross-examination by all counsel who indicated an interest in probing those opinions. To be sure, the absence of publication, peer review, and confirmatory testing reduce the probative force and per-

suasiveness (in short, the weight) of Dr. Lodge's opinions. Moreover, as explained in detail below, the bottom line is that even giving every benefit of the doubt to Plaintiffs on the basis of Dr. Lodge's testimony—that is, squeezing that testimony for every ounce of weight that the testimony will bear—Plaintiffs cannot establish a showing of irreparable harm that would justify the entry of a mandatory injunction at this time.^{FN24}

FN24. Plaintiffs chose not to call Dr. Newcomb as a live witness and have relied only sparingly on her affidavit in their post-hearing memorandum. Moreover, much of her affidavit concerns the prospective harm to the aquatic environment of Lake Michigan if a reproducing population were present, which the evidence does not indicate to be the case at this time. Dr. Newcomb's testimony in that regard has little, if any, bearing on any disputed issue on which the disposition of the preliminary injunction motion turns. Dr. Newcomb also devotes considerable attention to reviewing and commenting on Dr. Lodge's work and to discussing the barrier system, the locks, and the sluice gates. Given the direct testimony and cross-examination of Dr. Lodge and other witnesses on those subjects during the hearings, Dr. Newcomb's views have not come into play on those subjects either. Because Dr. Newcomb's opinions have not informed the Court's decision to any significant degree at the preliminary injunction stage, any detailed discussion of the motion to strike Dr. Newcomb's affidavit is unnecessary and the motion is denied without prejudice.

***27** As noted above, the centerpiece of Plaintiffs' claim of irreparable harm is Dr. Lodge's testimony based on the positive eDNA results that he reported above the electric barrier, along with the discovery of a single live fish in Lake Calumet and one dead fish found (below the barrier) in the December 2009 rotenone event. Yet the eDNA results and those few fish, amongst the hundreds of thousands of pounds of fish collected, do not establish the requisite likelihood of imminent or irreparable harm. Nor does the state of the eDNA science permit a reasonable inference that live Asian carp are in the canal system above the barrier in numbers that present an imminent threat. Negative eDNA results comprise a super-majority of the results when compared to the number of samples taken. For example, in 2010, out of 536 samples taken, ten were positive for silver carp and none were positive for bighead carp. Furthermore, no one can say for sure what a positive result means—it may correspond to a live fish, a dead fish, or simply the presence of fish mucus, feces, urine, or other cells. Lodge Testimony 114:24–116:4 (acknowledging that a limitation of eDNA is that there is no way of measuring the relative

abundance of fish producing the detection signal and no way to tell the number of fish). Dr. Lodge believes that a positive eDNA result shows “multiple” live fish, but at the current time, that prediction cannot be confirmed or even supported by other evidence. Mr. Chapman agrees with Dr. Lodge's surmise that the most likely explanation for a positive test result is the presence of at least one live fish. But even accepting that explanation as most likely correct, the credible testimony of those witnesses with extensive expertise in Asian carp biology and in assessing populations of Asian carp indicates that if Asian carp are in the CAWS above the barrier, they are there only in low numbers—numbers that are effectively being assessed and managed by the aggressive inter-agency effort and that do not present an imminent threat to establish a successful breeding population. See Wooley Testimony 474:25–475:20; Chapman Testimony 412:17–24.

It is not clear from the testimony at the hearing that the absence of positive eDNA results in the area where the one live fish was found means the absence of fish. Lodge 82:13–83:5. But Dr. Lodge did explain that he draws conclusions from negative eDNA results in regard to whether fish are present. Specifically, he stated that he disagreed with the May rotenone action because of negative results that followed positive results, negative results which he believes indicated a lack of Asian carp. This highlights the limits on the power to predict on the basis of eDNA results. See also Lodge 68:8–13 (positives over different years indicate fish), 70:23–25, 71:1–7 (negatives predict absence of fish), 83:3–6 (negatives do not correlate to absence of fish), 67:21–25, 68:1–7 (positives six months later indicate fish presence despite intervening negatives). Further, the eDNA results for the sampling from Lake Calumet (where the one fish above the barrier was found) have all been negative and in areas below the electric barrier where live fish are known to be abundant, the results are not always positive. The live fish caught in Lake Calumet also does not equate to a sustainable population of fish above the electric barrier, nor does it show any alleged failure of the barrier as that one fish's origins are unknown. Nothing in the record indicates whether the fish swam across the electric barriers, was carried to the location via ballast water or a bait bucket, or released above the electric barrier by a third party. And while Plaintiffs are correct that no one has testified (or likely would testify) that the barrier is impervious to penetration by a determined Asian carp, the presence of a single live fish (or a small number of individual live fish) above the barrier is far too thin a basis from which to infer that the barrier is not effective. In short, Plaintiffs have not offered sufficient evidence that the electric barrier fails to effectively deter Asian carp migration, and the assertions in Plaintiffs' reply brief in that regard are unsupported by the testimony.

***28** In fact, the documented evidence strongly suggests that the electric barrier is working to effectively deter Asian carp and is not simply an “experiment of unknown efficacy” as Plaintiffs contend. The Corps has designed and implemented—and continues to evaluate and fine tune—the components of the barrier. The recently completed additional barrier along the Des Plaines River and I & M Canal complements the efficacy of the barrier. Furthermore, all of the experts on the risk assessment panel (including Sass, on whom Plaintiffs rely heavily) opined that a self-sustaining population of Asian carp exists below the electric barrier and not above it.^{FN25}

FN25. Additionally, larval fish tows in the CAWS have not turned up any larval Asian carp.

Other evidence reinforces Chapman's and Wooley's assessment that only a small number of Asian carp individuals exist in the CAWS above the electric barrier. In the past year, the resource agencies have conducted 3,200 hours worth of surveying and placed miles of nets in the CAWS. The ACRCC Monitoring subcommittee has established five fixed-site monitoring stations within the CAWS, from which sampling events are conducted weekly. As Mr. Wooley and Dr. Lodge explained, the value of electrofishing and netting depends on the level of effort and combination with other tools. Wooley 489:9–14 (the shortcomings of the traditional methods can be overcome by frequency, repetition and utilizing various tools and certain combinations); Lodge 119:16–18 (acknowledging that in the case of rare species, increasing the sampling effort makes the traditional methods effective). The Court accepts Plaintiffs' contention that the traditional sampling efforts only result in a small percentage of actual fish present being captured and that these particular fish are hard to capture, yet even Plaintiffs' counsel has described the effort here as “extensive.”

Furthermore, the December 2009 rotenone event, which poisoned 5.7 miles of waterway below the electric barrier, resulted in the discovery of only one Asian carp. The May rotenone event near the O'Brien Lock was conducted in an area where multiple positive eDNA samples had been collected, yet no Asian carp were found out of 130,000 pounds of fish recovered. Any suggestion that the absence of Asian carp after the May rotenone event was the result of fish sinking to the bottom before they could be seen is contrary to the testimony that the ACRCC utilized underwater cameras and divers to determine whether all dead fish were accounted for. Putting all of the evidence together—

er—the eDNA results (both positive and negative), the sustained electrofishing and netting activities above the electric barrier, the lack of fish recovered during the rotenone activities, the one fish discovered in Lake Calumet, the larval fish tows, the evidence that the electric barrier is effectively deterring fish migration, the scientific opinions of the risk assessment panel, and the efforts to reduce propagule pressure below the electric barrier—Plaintiffs have not made a convincing case that the numbers of Asian carp above the electric barrier are significant. Furthermore, Plaintiffs have not established that Asian carp are positioned to establish a breeding population above the electric barrier. Nor have Plaintiffs shown that the fish is anywhere near, much less on the verge of, establishing a population in Lake Michigan. In short, as Mr. Chapman concluded, there is “no evidence as yet that [Asian carps have entered the Great Lakes in sufficient numbers to establish a successful breeding population]” or that they are close to doing so.^{FN26} Chapman Decl. ¶ 12.

FN26. Single live bighead carp have been caught in Lake Erie on multiple occasions, yet there is no indication that the species has established itself.

***29** In fact, below the barrier, the invasion front of Asian carp was placed at approximately Morris, Illinois, in Spring 2009, and with more certainty further downstream of the barrier in the Marseilles pool, based on the recovery of juvenile Asian carp there. During the hearing, Plaintiffs' expert was “highly uncertain” as to where the invasion front is located, but agreed that Asian carp have been recovered from the Illinois River using traditional methods for a decade and from the Dresden Island pool since at least 2002. However, the testimony indicates that only a very small number of Asian carp have been seen in the vicinity of the next pool going north, the Brandon Road pool, which is located several miles south of the barrier. Consistent with that testimony, which the Court reviewed with counsel for both sides at the post-hearing argument, Dr. Lodge admitted that “it was likely” the case that the propagule pressure decreases as one moves northward toward the Brandon Road and Lockport pools.

These conclusions are not without additional support in the record. Conditions in the lower Illinois waterways appear to be ideal for Asian carp. As Dr. Lodge noted, in order to predict whether a species can successfully invade an area, scientists look at the potential pathways, the characteristics of the species, whether food would be abundant, whether the species could reproduce in the area, and how temperature would affect the species. In the lower Illinois waterways, there are numerous shallow backwaters, side channels,

adjacent wetlands, and bays that provide habitat for recruitment. In contrast, the upper reaches of the Illinois waterway contain deeper channels with reduced Chlorophyll-a levels ^{FN27} and smaller stretches of undammed, free-flowing water.

FN27. Chlorophyll-a is a typical index that's used to indicate the abundance of phytoplankton. Phytoplankton are considered a primary diet of Asian carp. One expert (Dr. Susan Cooke) has modeled areas of Lake Michigan and labeled those areas a "plankton desert." As part of its efforts to address the threat posed by Asian carp, the USGS is conducting alternative food studies to determine if Asian carp can survive on other food in the Great Lakes.

Moreover, even if the evidence indicated greater propagule pressure on the barrier and/or the likelihood of a more sizable population of individual Asian carp beyond the barrier, it is far from certain that Asian carp can survive and reproduce in the Great Lakes. See generally Chapman Testimony 377:21–23 ("There's a great deal of uncertainty * * * we don't know whether the fish will for sure take off and establish large populations, neither do we know that they will survive."); see also Lodge Testimony 121:8–12 (noting "a great deal of uncertainty about what parts of the Great Lakes might be most at risk from invasion"). As one scientist explained: "The likely survival and growth of individual Asian carp does not necessarily mean that, even with high propagule pressure, Asian carps would successfully invade the Great Lakes and develop extremely large populations that would cause undesirable economic and environmental problems. *This remains an unknown.*"^{FN28} Chapman Decl. ¶ 6 (emphasis added).

FN28. Factors including (i) length of turbid river needed to spawn, (ii) temperature of the water, and (iii) available diet affect the analysis of whether the Great Lakes is a potential reproductive habitat.

Mr. Chapman also explained that the establishment of a fish population depends on the number of fish present and opined that invaders usually require multiple introductions. Chapman 385:23–386:18, 393:2–4 ("Ninety percent of invasions are thought to fail"). Defendants' evidence posits that if an invasion of Asian carp into the Great Lakes does occur, it will probably take many years (possibly one to three decades) for the population to become problematic, based on the history of Asian carp invasions, models of invasive species, and the size of the Great Lakes. Chapman 386:19–390:12; Wooley 469:16–24 (discussing the risk assessment experts estimations that it could take up to twenty-five

years for the establishment of an Asian carp population in Lake Michigan). To be sure, no one puts the probability of Asian carp establishing in the Lake at zero. See Chapman Testimony 404:21–23 (stating that it is “within the range of possibility that Asian carp could establish a population in Great Lakes and become problematic”). Indeed, most, if not all, of the experts involved in the USFWS Risk Assessment answered in the affirmative to a “yes” or “no” question concerning whether there was an imminent threat that Asian carp would establish a self-sustaining population in Lake Michigan. However, “imminent” was not defined, and the evidence before the Court at this time does not demonstrate the likelihood of irreparable injury that would be required for a mandatory preliminary injunction to issue. See *Winter*, 129 S.Ct. at 374–375.

*30 In sum, the Court concurs in Mr. Chapman's credible assessment that while “[t]he potential for damage [to the Great Lakes] is high * * * the level of certainty that any damage will occur is low.” Chapman Decl. ¶ 27; Chapman 392:14–394:13. Because the level of certainty of harm is low based on the evidence adduced to date, it cannot be said that irreparable injury is “likely,” as must be the case to justify the entry of any preliminary injunction. And here, the showing of irreparable harm would have to be higher still under the sliding scale, given the less than compelling showing on the merits of both of Plaintiffs' substantive claims and the judicial restraint principles discussed above that come into play where, as here, multiple federal and state agencies are expending significant effort carrying out their statutory and regulatory duties to maintain and operate the CAWS, study and address the threat of Asian carp, and take whatever emergency measures they deem appropriate to prevent Asian carp “from dispersing into the Great Lakes.”

C. The Public Interests at Stake and Balancing of Harms

Although the Court's assessment of the likelihood of success on the merits and irreparable harm factors alone is dispositive, in keeping with the Seventh Circuit's guidance (see *Girl Scouts of Manitou Council*, 549 F.2d at 1087, discussed *supra* p. 24, n. 16), the Court addresses briefly the remaining preliminary injunction factors. Plaintiffs contend that the permanent ecological and economic harm that could result from the establishment of Asian carp in the Great Lakes ecosystem is likely to exceed what Plaintiffs' refer to as the “temporary” economic impacts of the injunctive relief requested, including the effects on the navigation in the vicinity of the Chicago and O'Brien Locks. In response, Defendants and Defendant–Intervenors maintain that Plaintiffs' proposed relief would have significant consequences for flood control, public safety, and the economy of the area—concerns that Defendants contend are sufficiently grave to counsel against im-

plementing the requested relief in the absence of appropriate study.

The locks and sluice gates at the Chicago River Controlling Works, the O'Brien Lock and Dam, and the Wilmette Pumping Station are used to relieve flooding, divert water from Lake Michigan, expedite responses to search and rescue and law enforcement emergencies, transport cargo, and promote recreation. Plaintiffs propose that bulkheads be immediately and indefinitely installed to close both locks, maintaining that the relief that they seek is consistent with the protection of public health and safety. Plaintiffs also seek an order requiring the installation of screens on sluice gates. Defendants maintain that installing bulkheads at both locks, and stationing a barge and crane at each lock to remove the bulkheads, if necessary, would: (1) increase flood risks; (2) divert millions of dollars from necessary Corps' projects; and (3) delay critical Coast Guard missions. Defendants further contend that installing sluice gates significantly increases the risk of flooding due to the potential of the screens to blind or clog. Additionally, Defendants and Defendant-Intervenors have cited the economic harms that would be caused by Plaintiffs' proposed relief.

***31** All of the parties appear to agree that the ability to move water from the canals into Lake Michigan is an essential flood-control tool. Guarding against flooding regularly requires the use of the locks and sluice gates that Plaintiffs seek to close with limited exception. As recently as July 24, 2010, flooding required the Corps to open the Chicago Lock and Controlling Works and the District to open the sluice gates at the Chicago Lock and Controlling Works and the Wilmette Pumping Station.^{FN29} According to Defendants, without the ability to mitigate flood conditions in the canals, the Corps and District would face a real possibility of both dangerous flooding and hazardous sewage backups into the City of Chicago.

FN29. Since 1986, the District has been forced to reverse flow to Lake Michigan through the Chicago Lock and Controlling Works and/or sluice gates (ten times), the O'Brien lock and sluice gates (four times), and the Wilmette pumping station sluice gates (twenty-one times).

Plaintiffs contend that the planned closure of the Chicago Lock for six months (between November 2010 and April 2011) for repairs indicates that it is possible for the Corps to manage flood control while the locks are closed. While repairing the Chicago Lock, the Corps will install temporary bulkheads during the winter months. According to the Corps,

it is taking significant steps to minimize the risk of flooding during the repair by stationing a barge and crane at the Chicago lock at a cost of at least “\$12,000 a day.” Peabody Testimony 283:20–21. The Corps plans to begin removing the bulkheads as a precautionary measure based upon weather forecasts, meaning that bulkheads may have to be removed even if the lock is not ultimately used for flood control. Even so, the undisputed testimony during the hearing is that it can take a minimum of three hours longer to remove bulkheads than it does to conventionally open the lock, and it is impossible to remove the bulkheads under certain weather conditions. Although Plaintiffs correctly point out that the sluice gates, not the locks, provide the primary flood control mechanism, the locks are needed in high-risk situations. The Chicago rainstorm on July 24, 2010, illustrates the risks posed by Plaintiffs' proposal. The Corps found it necessary to use the Chicago lock to relieve flood waters within “three hours” of the time when the water levels in the CAWS began to rise, and opened those locks immediately upon request from the District. The rainstorm “would have caused significant flooding in * * * if the Chicago sluice and lock gates had not been opened quickly.” Peabody Decl. at ¶ 55(a); see also Su Testimony 566:2–16. Based on the evidence adduced during the hearing, the Corps' plan to take significant, costly steps to minimize flood risks during its repair of the Chicago lock during the less-risky winter months does not establish that both locks could be bulkheaded indefinitely without imposing unreasonable flood risks.

There also is concern that Plaintiffs' proposal would impose risks upon the public beyond Chicago, as it would divert finite Corps resources from other needed projects. The evidence presented during the hearing was that Plaintiffs' proposed installation of bulkheads and cranes at both locks would require the diversion of millions of dollars of limited Corps' resources to mitigate the flood risk posed by installing bulkheads, and that such expenditures will “have a direct impact” on the Corps' ability to conduct critical repairs at other facilities—increasing the risk of lock failures because these projects “will not get done.” Similarly, dedicating the Corps' limited supply of bulkheads to the O'Brien Dam would reduce the Corps' ability to respond to emergencies on the Mississippi River, which has a greater need for the bulkheads.

***32** To their credit, Plaintiffs recognize that delaying Coast Guard responses to search and rescue and law enforcement missions would impose unacceptable risks upon the public. See Reply at 27–29. Yet Plaintiffs' revised proposal would increase the Coast Guard's response times for some of these missions by effectively terminating navigation through the locks. Plaintiffs' response—suggesting that the Coast Guard should be able

to fulfill its missions if both locks are closed because it plans to cope with the scheduled repair of the Chicago lock this winter—does not account for the balancing of harms that the Corps and Coast Guard must deal with on a daily basis. A temporary interruption of the Coast Guard's use of the Chicago lock, and resulting increase in response times during the less-busy winter season, may be warranted because the Corps' repair of the lock will promote public safety in the future by providing for faster response times. Yet closing both locks indefinitely would result in more delays, for a longer period of time and during busier times of year, than those imposed by the Chicago repairs that the Coast Guard has deemed necessary.^{FN30}

FN30. Plaintiffs suggest that these risks could be avoided if the Coast Guard established one or two stations on the riverward side of the locks. However, the Coast Guard is not a defendant in this action. Furthermore, the addition of new stations would require the acquisition of new land plus construction and staffing, concerns for which Plaintiffs have not accounted.

Plaintiffs also propose that Defendants be ordered to install screens on all sluice gates at the O'Brien, Chicago, and Wilmette structures and that Defendants address the flood risks posed by the screens by installing raking machines to remove debris from the screens. Even if the Corps had funds for both the machines and the modification, Plaintiffs have not established that raking machines would adequately remove debris from screens under flood conditions at O'Brien. Moreover, installing sluice gates screens would increase flood risks if coupled with the proposed bulkheading of the locks. Screens reduce the flow of water through sluice gates regardless of whether they are blocked by debris. Therefore, the locks might have to be used more quickly and frequently if more screens were installed. The increased reliance on the locks to relieve flood waters would impose additional risks upon the public if coupled with Plaintiffs' proposal to install bulkheads in both locks, which would increase the amount of time required to open the locks.

Plaintiffs similarly fail to establish that it is in the public interest to install block nets and/or physical barriers in the Calumet and Little Calumet Rivers. Reply at 26–27 (asserting that block nets “are far less likely to contribute to flooding than fixed, impermeable structures.”). Plaintiffs propose that multiple, parallel block nets be installed in each river. According to the evidence presented by Defendants and not rebutted by Plaintiffs, each block net installed would increase flood risks, as the nets would catch the “great deal of

debris” that flow through the CAWS during flood conditions. Peabody Testimony 357:23–359:3; Su Decl. ¶ 17; Su 566:21–567:10. The Corps maintain that it continues to study the possibility of using block nets to fight Asian carp, but that it has been unable to identify a barrier that would be effective at impeding Asian carp without inducing flooding. Peabody 358:17–359:3; Peabody Decl. ¶ 58. As with Plaintiffs' proposed mandatory relief requiring the installation of bulkheads and sluice gate screens, Plaintiffs have not established that block nets or interim barriers would not increase flood risks.

***33** In addition to the public safety issues, Defendants and Intervenors also presented evidence regarding the economic impact of the relief sought by Plaintiffs. The Coalition presented evidence of more than \$1.2 billion annually in direct spending on activities associated with the operation of the Chicago and O'Brien locks, including commercial shipping, recreational boating, commercial cruises, and tours and municipal protection. The Coalition's expert also testified that the actual impact of closing these two locks could be close to \$4.7 billion. These impacts include the diminished commercial shipping and tourist cruises, additional costs to maintain highways as a result of increased traffic, flood and municipal protection, and property value loss. Although Plaintiffs contest some of Defendants' figures, even accepting Plaintiffs' calculations there is no question that closure of the locks would have an immediate and significant effect on the regional economy.

Finally, Defendants highlight the fact that Plaintiffs' proposed relief would, among other things, have the effect of substituting the Court's judgment for the considered decisions of the multiple agencies that traditionally have balanced the competing concerns about flooding, public safety, and nuisance species in discharging their public duties relating to the area's water resources. Although Plaintiffs readily acknowledge the need to preserve certain functions enabled by the locks and sluice gates—by allowing for their use “as needed to protect public health and safety”—Plaintiffs ask the Court to decide: (1) when, whether, and how the locks should be permitted to open in emergencies; (2) how the sluice gates should be operated to protect public health and safety; (3) how screens over the sluice gates should be maintained; (4) whether to install block nets or other interim barriers in the Calumet and Little Calumet Rivers; (5) what methods should be used to capture or kill Asian carp; (6) how to monitor for the presence of Asian carp; and (7) the time frame for completing the final results of the Corps' long-term study of the permanent physical separation of the Great Lakes and Mississippi Basins. Those matters harken back to the concerns articulated by the Fourth Circuit in the *TVA* case and underscore

why requests for mandatory injunctive relief of that nature should be “cautiously viewed” and “sparingly issued” only upon the “clearest equitable grounds.” *Graham*, 130 F.3d at 295.

At the end of the day, Plaintiffs have not carried their burden of showing that the balance of the harms weighs in their favor. Indeed, based on the evidence of record, the harms associated with the potential for increased flooding and sanitary issues and the economic hardships associated with the requested relief outweigh the more remote harm associated with the possibility that Asian carp will breach the electronic barriers in significant numbers, swim through the sluice gates and locks, and establish a sustainable population in Lake Michigan.

***34** In sum, having carefully considered the extensive evidence and legal argument presented by all of the parties, the Court concludes that it cannot grant the relief requested by Plaintiffs in their motion for preliminary injunction. The Court stresses its recognition that the *potential* harm in a worst case scenario is great. However, Plaintiffs have not presented sufficient evidence to demonstrate either (1) more than a modest likelihood of success on the merits of their substantive claims or (2) that the potential harm is either likely or imminent, such that judicial intervention in the form of a mandatory injunction is warranted at this time.

III. Conclusion

For the reasons set forth above, the Court denies Plaintiffs' motion for a preliminary injunction [9]. The Court also denies without prejudice Intervenor Wendella Sightseeing Company's motion to strike the testimony of Dr. Newcomb [71] and Intervenor Coalition to Save Our Waterway's motion in limine to strike the testimony of Dr. Lodge [107].^{FN31}

FN31. The denials of the motions to strike are without prejudice to any motions that Defendants or Intervenor Defendants may wish to file in regard to any testimony that Dr. Lodge or Dr. Newcomb may seek to present in other phases of this case.

N.D.Ill.,2010.

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