Milwaukee Harbor Dredged Material Management Facility Fish Removal Effort

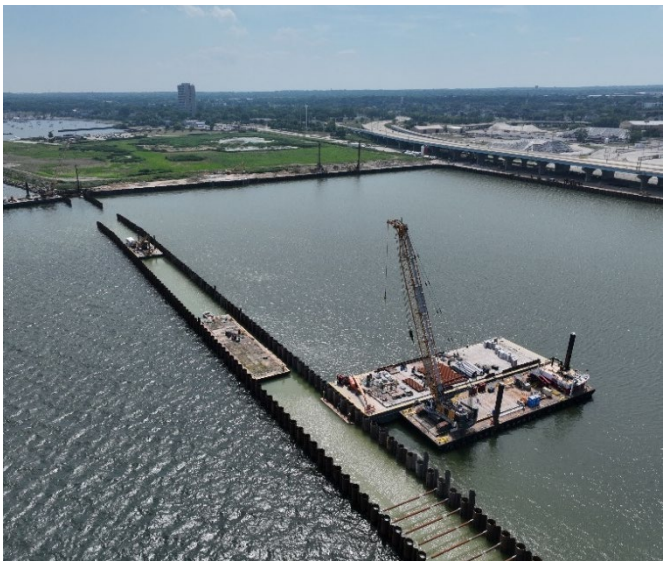

Photo Credit: Milwaukee Metropolitan Sewerage District (MMSD)

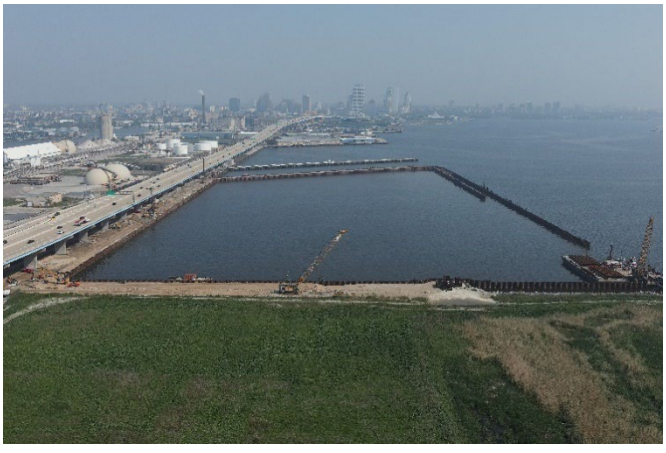

Photo Credit: MMSD

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Bureau of Fisheries Management

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Introduction

The goal of this effort was to remove as many fish as possible from the construction site of the Dredged Material Management Facility (DMMF) in the Milwaukee harbor to prevent trapping fish inside the DMMF when its outer containing walls were fully sealed. When construction of the facility is completed in late 2026, it will safely store contaminated sediment that will be dredged from the Milwaukee Estuary Area of Concern. For more information on the DMMF, please visit the Waterway Restoration Partnership website.

As the outer walls to enclose the perimeter of the DMMF were nearing completion in mid-August 2025, Wisconsin Department of Natural Resources (DNR) crews caught and moved fish that were found inside the facility to other areas of the harbor. The highest priority species was lake sturgeon, so the gear used was targeted at juvenile sturgeon, as they are known to use this area and habitat in the summer months.

All fish caught and still alive were marked with a hole punch in the tail and relocated to the north side of the harbor where they were released by a DNR Office of Great Waters (OGW) support boat with a live well (Image 1).

Marking each relocated fish with a hole punch allowed for easy identification to determine if that fish was captured inside the facility again. A bubble curtain was installed by the construction contractor, Michels Corporation, and operated 24/7 across the only remaining opening of the DMMF to deter fish from entering the facility (Images 2 and 3).

The fisheries crew used multiple types of gear to collect many species of fish during this effort and spread that effort out to cover the majority of the DMMF construction site. Nets later in the survey were set on habitats and locations where other fish were concentrated on previous lifts to maximize catch. The duration of the removal effort was informed by the catch rate overall, especially of lake sturgeon. When depletion was evident, the effort concluded.

Image 1. A 686 mm (27 inch) sturgeon in a live well during transport to the north side of the Milwaukee Harbor.

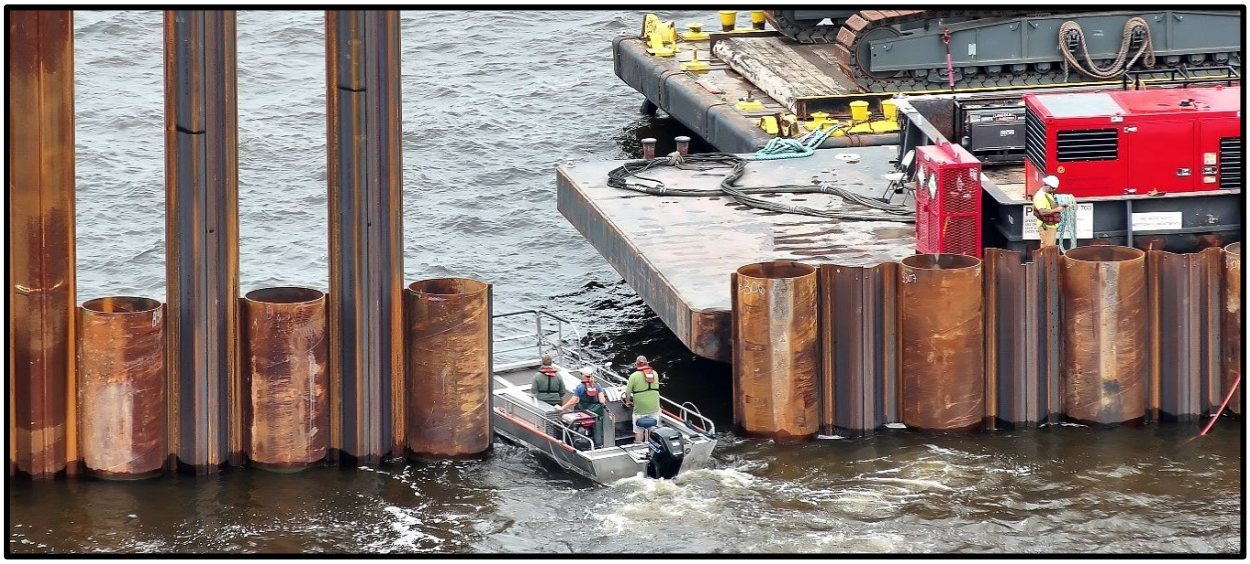

Image 3. A DNR boat navigates through the small opening the wall of the DMMF. Photo credit: MMSD.

Image 4. (Left) DNR netting boat approaching the small opening in the wall of the DMMF to exit the facility. (Right) Close up image of the bubbles created by the bubble curtain intended to deter fish from entering the facility during the removal effort.

Effort and Catch

Monday, Aug. 18

The fisheries crew set two 1,000-foot gill nets with the wind from southeast to northwest extending from one corner to the opposite (Figure 1). Surface water temperature was 71.5 degrees Fahrenheit at the start of the gill net set at 8:30 a.m. One of the 1,000-foot gill nets was lifted at 1 p.m. and set again immediately (Green line in Figure 1). In addition, two shorter nets (600 feet) with smaller mesh for a total of 3,200 feet of gill net effort was fished overnight. Only one large drum was caught in the 1,000-foot net lifted on Monday afternoon that was fished for 4.5 hours. The tail was hole punched, and it was released alive in the mouth of the river (Image 4).

Due to wind and wave conditions, no electrofishing was conducted on Monday.

Image 5. Image of a hole punch mark in the tail of a large drum captured in the short set gill net set and lifted on Monday, Aug. 18, 2025.

Figure 1. The green line represents the net set Monday morning and lifted Monday afternoon. The yellow line represents the net set Monday morning and fished overnight. The red lines represent nets set Monday afternoon and fished overnight.

Lifting Day 1, Tuesday, Aug. 19

The fisheries crew departed the dock at 8 a.m. to lift all four nets and electrofish around the perimeter of the DMMF and shallow areas. No fish were observed during the electrofishing efforts. The water was turbid and deeper than what is ideal for electrofishing, therefore, electrofishing was not conducted on subsequent days.

On the net lifts, a total of 252 fish were captured (Table 1). Most of the fish were gizzard shad (Image 6) and because they do not survive well in gill nets and are not desirable for human consumption, they were not saved. The crew rescued all other species if they were in good condition. Even with 72-degree water temperatures from top to bottom, 23 of the fish were relocated. Without counting the gizzard shad, 23 fish out of 40 fish were relocated. Two fish (northern pike and walleye) were filleted by Milwaukee Great Lakes Sport Fishermen volunteers and donated to the Hunger Task Force. The remaining dead fish were unfit for human consumption.

Image 6. Many gizzard shad and a white sucker caught in the gill net within the DMMF.

A highlight of the day was catching six lake sturgeon (Image 7). All six sturgeon were Passive Integrated Transponder (PIT) tagged and right ventral (RV) fin clipped which indicate that they originated from stocking efforts from the Milwaukee River streamside rearing facility (Milwaukee River SRF). Additional information on that effort can be found at https://dnr.wisconsin.gov/topic/Fishing/lakemichigan/LakeSturgeon.html.

Image 7. Two sturgeon captured in the gill net within the DMMF held by DNR staff Anna Schwarzkopf (left) and (right) University of Wisconsin-Milwaukee graduate student Emma Millsap.

The sturgeon ranged in size from 332 mm (13 inches) to 686 mm (27 inches). Each of these fish contained a PIT tag from the year they were stocked and included one fish stocked in 2021, one stocked in 2022, two stocked in 2023 and two stocked in 2024. These fish ranged from 126 mm to 180 mm at the time of stocking and exhibited very fast growth rates. For example, the smallest fish captured on Tuesday was 332 mm but was stocked less than a year ago at 167 mm. In eleven months, that fish grew 6.5 inches.

All four nets were re-set for a second full day of lifting on Wednesday, Aug. 20 (Figure 2), with the intent of resetting again Wednesday if another handful of sturgeon or other rare species were encountered.

Table 1. Total catch of each species of fish in each net lift during the first lifting day of the DMMF fish removal effort with the exception of net 1. Net 1 was set and lifted on Monday and only fished for 4 hours.

Table 1. DMMF Lift Day 1

Species	Net 1	Net 2	Net 3	Net 4	Net 5	Totals
Lake Sturgeon		3	3			6
Drum	1	6	1	7		15
Gizzard Shad		16	111	82	3	212
Walleye			1			1
Smallmouth bass		1	1			2
Northern pike			1			1
White sucker				10		10
Rock bass		1				1
Quillback		1				1
Channel catfish			1		2	3
Total	1	28	119	99	5	252

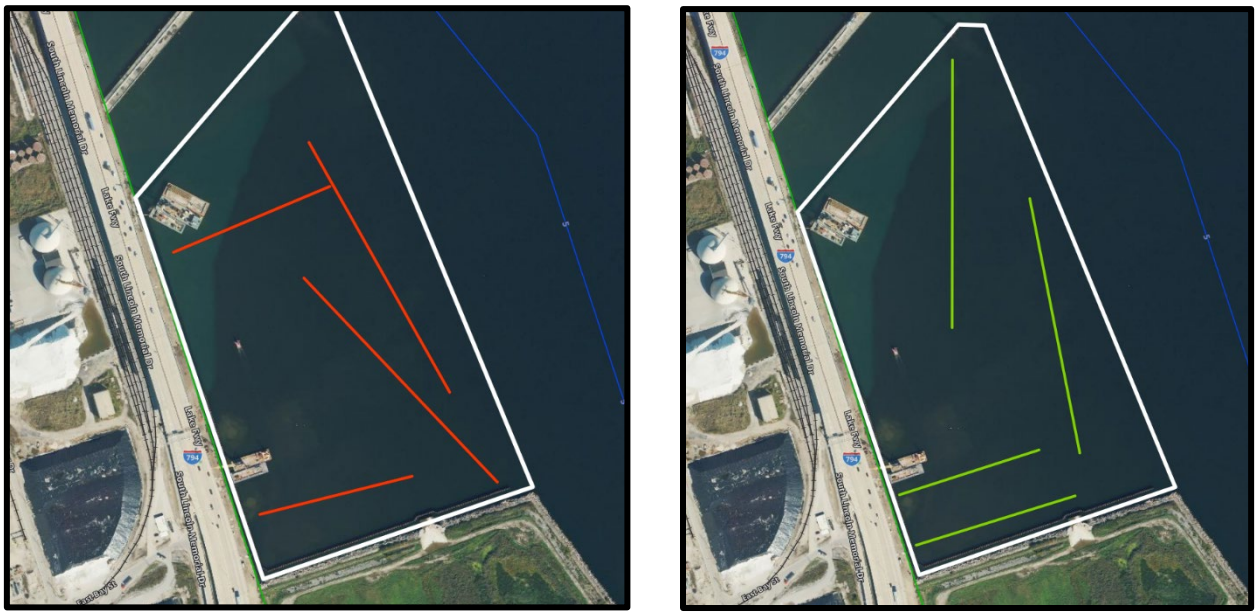

Figure 2. (Left) Map depicting the location of nets lifted on Tuesday morning. (Right) Map depicting the location of nets set Tuesday late morning and lifted Wednesday morning.

Lifting Day 2, Wednesday, Aug. 20

All four gill nets were lifted. The gill net on the far south side got caught up in some large debris or boulders and broke while retrieving it, leaving the crew with three functional gill nets (two 1,000-foot nets and one 600-foot net). Total catch on lifting day two was lower than lifting day one. Fifty-eight fish were caught on lifting day two (Table 2). Twenty-three of those fish were not gizzard shad, and 12 of those fish were relocated outside of the facility. Three sturgeon were captured on day three, so two gill nets were re-set in locations proven to catch sturgeon (when present) on previous lifts. Two baited set lines targeting sturgeon were also set to try out a third gear type. The goal for this fish removal effort was a reduction in catch of sturgeon and all species. An additional day with reduced catch per effort would conclude the removal effort.

Two of the three sturgeon captured on lifting day two were PIT tagged. All three sturgeon had right ventral fin clips indicating that they were stocked from the Milwaukee River SRF. One of the sturgeon that had a PIT tag was stocked in 2023 and the other in 2024. The third fish that did not have a PIT tag was likely stocked in 2023 based on its similar size and estimated growth rate. All the sturgeon captured in the fish removal effort were stocked as part of the Milwaukee River sturgeon rehabilitation project.

Table 2. Total catch of each species of fish in each net lift during the second lifting day of the DMMF fish removal effort.

Table 2. DMMF Lift Day 2

Species	Net 6	Net 7	Net 8	Net 9	Totals
Lake Sturgeon		2	1		3
Drum		3			3
Gizzard Shad	19	15		1	35
Walleye					0
Smallmouth bass	1	1			2
Northern pike	1				1
White sucker		1			1
Rock bass	9	1			10
Quillback					0
Channel catfish	1	1		1	3
Total	31	24	1	2	58

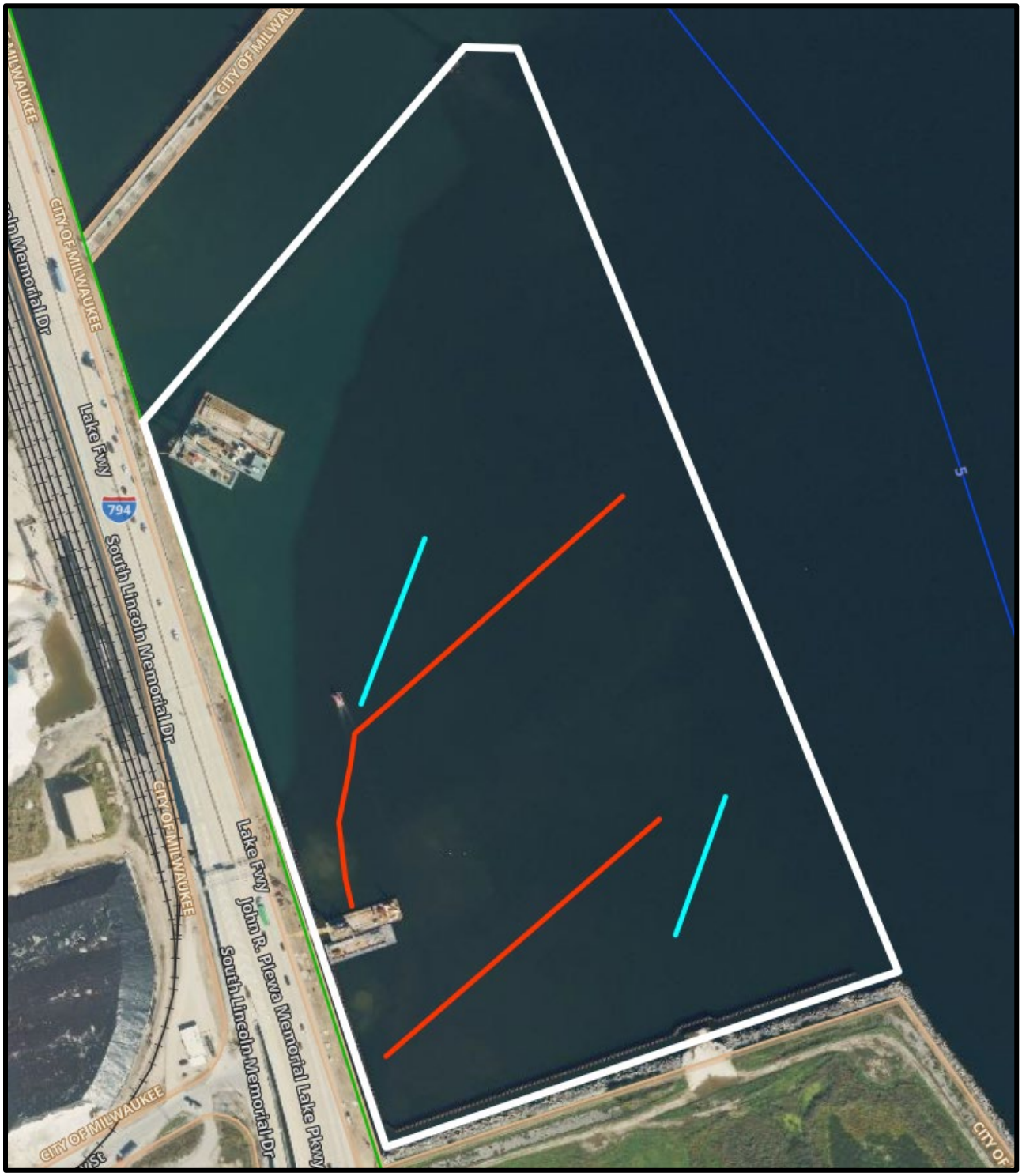

Figure 3. Map depicting effort set on Wednesday and lifted Thursday within the DMMF. The red lines represent gill nets and the light blue lines represent the set line locations.

Lifting Day 3, Thursday, Aug. 21

The fisheries crew lifted both gill nets Thursday morning. Only five fish were caught in 1,600 feet of gill net (Table 3): two white suckers, one drum, one rock bass and one gizzard shad. The crew also lifted the two set lines that soaked overnight but no fish were captured.

Image 8. A set line rigged on the front of the DNR boat immediately before setting.

Image 9. Freshwater drum captured in the DMMF fish removal effort.

Table 3. Total catch of each species of fish in each net and set line lift during the third and final lifting day of the DMMF fish removal effort.

Table 3. DMMF Lift Day 3

Species	Net 10	Net 11	Set line 1	Set line 2	Totals
Lake Sturgeon					0
Drum	1				1
Gizzard Shad		1			1
Walleye					0
Smallmouth bass					0
Northern pike					0
White sucker	2				2
Rock bass	1				1
Quillback					0
Channel catfish					0
Total	4	1	0	0	5

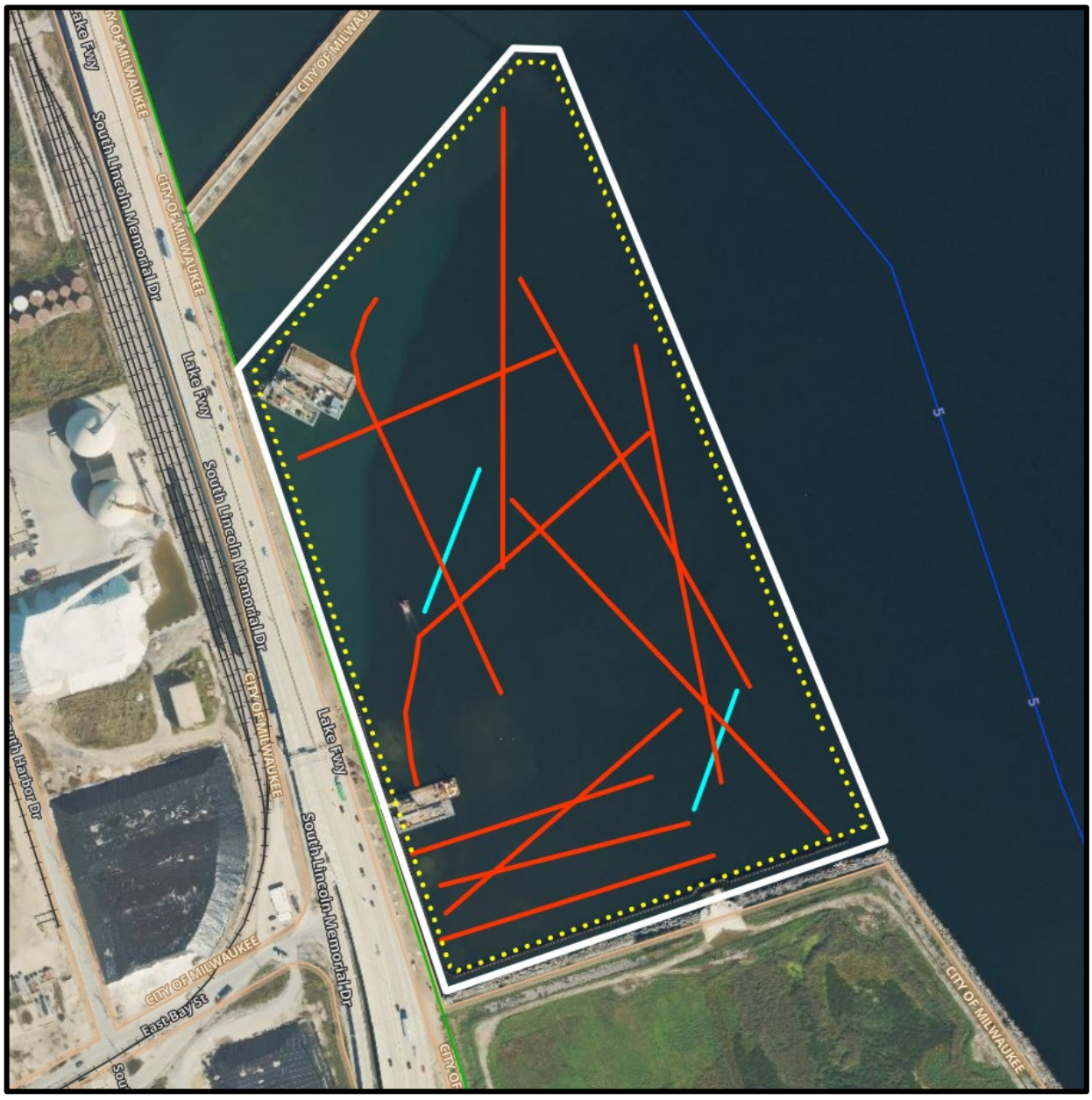

Figure 4. Map depicting all fishing effort in the DMMF. The red lines represent gill net locations. The light blue lines represent the set line locations, and the yellow dotted line shows the electrofishing transect around the inside perimeter of the facility.

Conclusion

A total of 315 fish were captured and removed from the DMMF in four days of effort. Thirty-seven fish were moved and released on the north side of the harbor. Most of the catch was gizzard shad (248) followed by freshwater drum (19), white sucker (13), rock bass (12), lake sturgeon (9), and channel catfish (6) (Table 4). Other species encountered in low numbers included walleye, northern pike and quillback.

Catch per net lift of all species began at over 50 fish per net on Tuesday, decreased to 14.5 fish per net on Wednesday and decreased to 2.5 fish per net on Thursday (Figure 5). Catch of sturgeon also decreased from more than one per net lift to zero on the last day (Figure 5).

The depletion of catch of all species suggests that the fisheries crew was effective at removing most of the fish inside of the facility. All fish that were released were marked and none of the fish caught in the survey were recaptures, indicating that the combination of moving fish north before releasing and the bubble curtain, was an effective method of deterring those fish from returning to the facility after release.

Table 4. Total catch of each species in the DMMF fish removal effort in Milwaukee, 2025.

Table 4. All Lifts

Species	Total Number Caught
Lake Sturgeon	9
Drum	19
Gizzard Shad	248
Walleye	1
Smallmouth bass	4
Northern pike	2
White sucker	13
Rock bass	12
Quillback	1
Channel catfish	6
Total	315

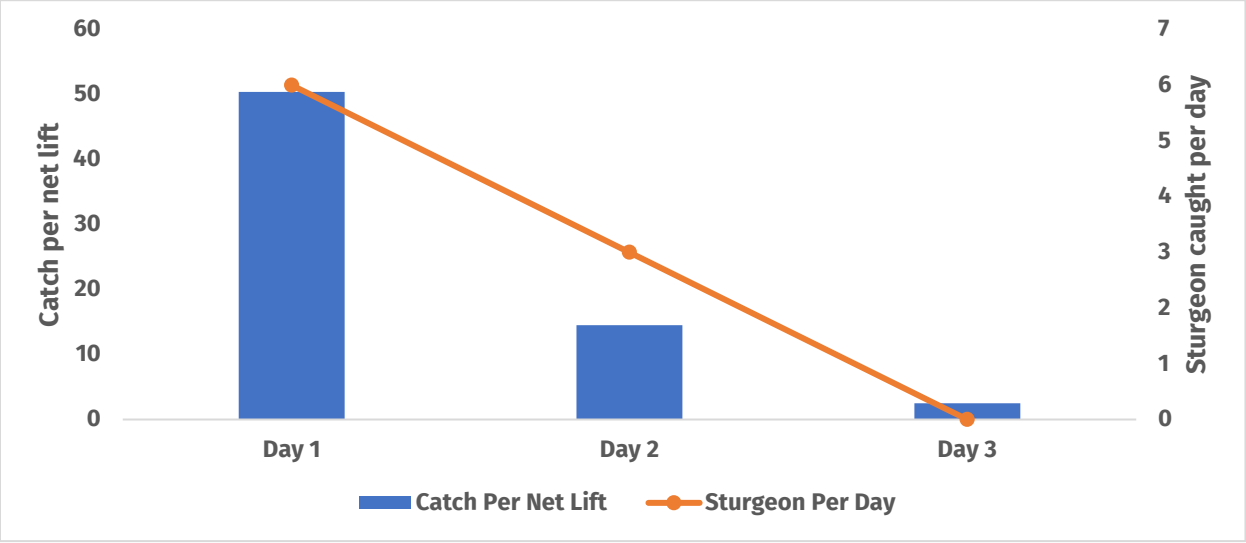

Figure 5. Catch of all species per net lift in the three days of fish removal in the DMMF (blue bars). Number of sturgeon caught in gill nets per day in the fish removal efforts in the DMMF (orange line).

Appendix A. Supplemental Images

Image 10. A barge and crane working near the small opening in the wall of the DMMF.

Image 11. DNR OGW staff Patrick Siwula holding a lake sturgeon before release near the Milwaukee Art Museum.

Image 12. DNR OGW staff Brennan Dow holding a lake sturgeon before release near the Milwaukee Art Museum.

Image 13. UW-Milwaukee Assistant Professor Brandon Gerig holding a large freshwater drum before release near the Milwaukee Art Museum.

Image 14. UW-Milwaukee Assistant Professor Brandon Gerig holding a freshwater drum before release near the Milwaukee Art Museum.

Image 15. UW-Milwaukee Assistant Professor Brandon Gerig (left) and DNR OGW staff Patrick Siwula holding channel catfish before release near the Art Museum.

Image 16. DNR crew sets a gill net that starts tight to the south wall of the DMMF. Photo credit: MMSD.

Image 17. DNR boats operating with the DMMF on the second day of the removal effort. Photo credit: MMSD.