

**CONOWINGO HYDROELECTRIC PROJECT
FERC PROJECT NUMBER 405**

**FISHWAY OPERATION AND MAINTENANCE PLAN
2024 ANNUAL REPORT**



Prepared for:



Prepared by:



and



March 2025

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LIST OF ABBREVIATIONS

cfs	cubic feet per second
Conowingo Project or Project Constellation	Conowingo Hydroelectric Project (FERC Project Number 405)
CWECF	Constellation Energy Generation, LLC
EFL	Conowingo West Eel Collection Facility
°F	East Fish Lift
FERC	degrees Fahrenheit
FOMP	Federal Energy Regulatory Commission
gpm	Fishway Operation and Maintenance Plan
MDNR	gallon per minute
mg/L	Maryland Department of Natural Resources
OCECF	milligrams per liter
PADEP	Octoraro Creek Eel Collection Facility
SRBC	Pennsylvania Department of Environmental Protection
USGS	Susquehanna River Basin Commission
WFL	United States Geological Survey
	West Fish Lift

EXECUTIVE SUMMARY

Constellation Energy Generation, LLC (Constellation), has operated fish collection facilities at its Conowingo Hydroelectric Project (Conowingo Project or Project) since 1972. These operations are part of a cooperative private, state, and federal effort to restore American Shad (*Alosa sapidissima*) and other migratory fishes to the Susquehanna River Basin.

The start of operation for the West Fish Lift (WFL) began on March 16, 2024, and continued to June 1, 2024. The East Fish Lift (EFL) began on March 15, 2024, and continued to May 17, 2024.

The WFL operated for 62 days in 2024 collecting American Shad for transporting upriver to the Columbia Riverfront Park Boat Ramp and the Canal Lock Boat Ramp. The number of lifts conducted in 2024 was 1,317 and fishing time totaled 799 hours and 23 minutes. A total of 247,982 fish of 40 species in addition to seven (7) Splake (*Salvelinus namaycush* x *Salvelinus fontinalis*), four (4) Tiger Muskellunge (*Esox masquinongy* x *Esox Lucius*), two (2) Striped Bass (*Morone saxatilis*) hybrids, and one (1) Tiger Trout (*Salmo trutta* x *Salvelinus fontinalis*) were collected and identified in the WFL sorting tank. Gizzard Shad (*Dorosoma cepedianum*, 231,212), Channel Catfish (*Ictalurus punctatus*, 5,582), Shorthead Redhorse (*Moxostoma macrolepidotum*, 3,224), and Northern Snakehead (*Channa argus*, 1,965) dominated the catch and comprised 97.6% of the total fish collected. Gizzard Shad alone accounted for 93.2% of the total fish collected. A total of 1,016 American Shad were collected at the WFL in 2024.

The Conowingo East Fish Lift (EFL) operated for 45 days in 2024 collecting American Shad for transporting upriver to the Columbia Riverfront Park Boat Ramp and the Canal Lock Boat Ramp. On April 12, 2024, the EFL Crowder Screen was severely damaged due to operator error, causing the EFL to not operate from April 13 through April 24, 2024¹. On May 17, the EFL was damaged due to operator error and was subsequently out of service for the remainder of the 2024 fish passage season. The number of lifts conducted in 2024 was 898 and fishing time totaled 518 hours and 52 minutes. A total of 826,767 fish of 31 species along with one (1) Splake and one (1) Striped Bass hybrid were collected and identified in the EFL sorting tank. Gizzard Shad (821,030), American Shad (1,621), and Channel Catfish (1,445) dominated the catch and comprised nearly 99.7% of the total fish collected. Gizzard Shad alone accounted for 99.3% of the total fish collected. A total of 1,621 American Shad were collected at the EFL in 2024.

The Conowingo West Eel Collection Facility (CWECF) began operation on May 1, 2024, with the first collection check taking place on May 2, 2024, as well. The facility operated for a total of 217 days from May 1 to December 3, 2024. A total of 371,655 juvenile American Eel (*Anguilla rostrata*) were collected at the CWECF.

¹ Operation to the EFL would have been suspended from April 14-16, 2024, due to high flows, which also prevented the Conowingo Maintenance Staff from assessing the damage.

1 INTRODUCTION

Constellation Energy Generation, LLC (Constellation), is the licensee for the 570.15-megawatt Conowingo Hydroelectric Project (Conowingo Project or Project). The Project is operated under a Federal Energy Regulatory Commission (FERC) license (Project No. 405)². The Project is located on the Susquehanna River in Pennsylvania and Maryland. Conowingo Dam is located at river mile 10 in Maryland connecting Cecil and Harford counties, as is the lowermost six miles of the Project reservoir, Conowingo Pond. The remaining eight miles of Conowingo Pond are in Pennsylvania, within York and Lancaster counties.

Constellation filed an Initial Fishway Operation and Maintenance Plan (FOMP) describing Constellation’s fish passage operations and maintenance activities with FERC on February 2, 2021. An update to the FOMP was filed on January 31, 2023. On January 3, 2024, Constellation filed notice to the Commission that during the 2024 season operations will be undertaken consistent with the FOMP submitted to the Commission on January 31, 2023.

Note the FERC license issued on March 19, 2021, was vacated by a DC Circuit Court decision on December 22, 2022. Constellation is currently operating under an annual license. As a result, a notification was filed with FERC on January 3, 2024, stating that due to aquatic invasive species and concern over spreading, the EFL would not operate in volitional mode and instead both the EFL and WFL would operate voluntarily in trap and transport mode.³ Although the license was vacated, Constellation continued to operate the fish lifts in accordance with the FOMP filed with FERC on January 31, 2023, and letter dated January 3, 2024.

2 IMPLEMENTATION

2.1 Project Operational and Supporting Data

2.1.1 Flow Data USGS Marietta Gage

Maximum, average, median, and minimum daily Susquehanna River stream flows in cubic feet per second (cfs) from United States Geological Survey (USGS) streamflow gage located at Marietta, PA (USGS gage no. 01576000) are shown in [Table 2.1.1-1](#) for the 2024 fish passage season (March 15 through June 1). [Figure 2.1.1-1](#) shows a time series of the daily flow data, and all values are contained in [Appendix A](#).

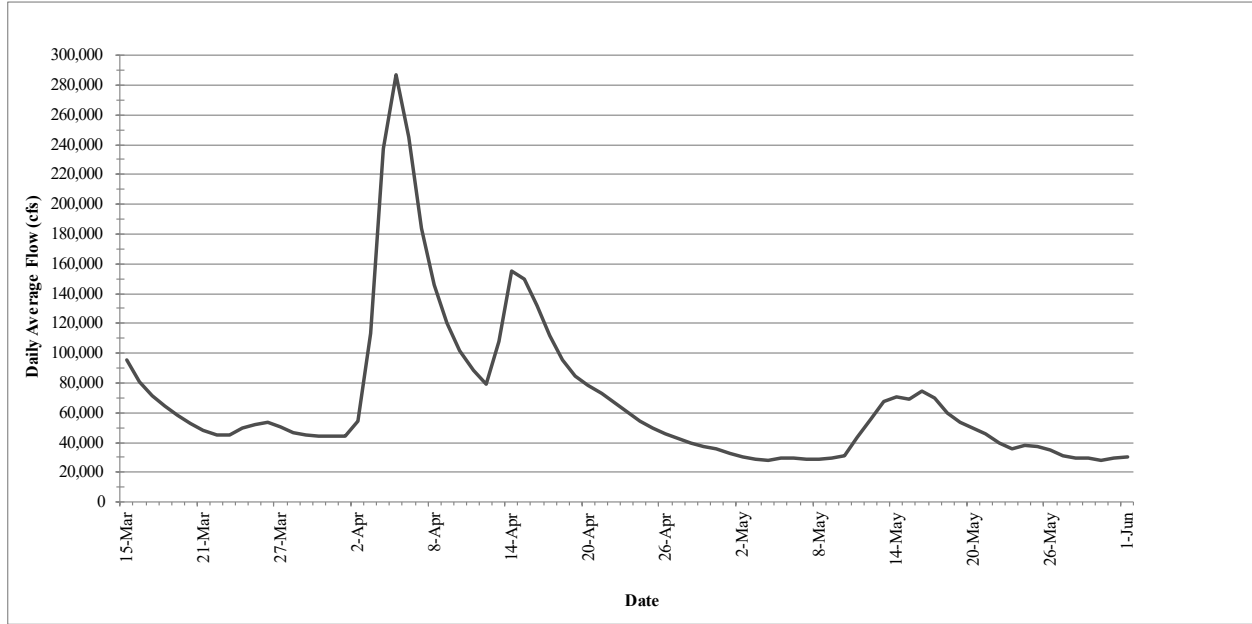
Table 2.1.1-1. Summary of 2024 Susquehanna River Stream Flow Data USGS Marietta Gage

Period	Maximum Daily Flow (cfs)	Average Daily Flow (cfs)	Median Daily Flow (cfs)	Minimum Daily Flow (cfs)
March 15 - June 1, 2024	287,000	68,218	50,200	28,200

² The Project’s license issued in March 2021 and subsequent approved plans were vacated with the DC Circuit Court decision on December 22, 2022. As such, this report is to be filed with the Maryland Department of the Environment, Maryland Department of Natural Resources (MDNR), Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, United States Fish and Wildlife Service, and the Susquehanna River Basin Commission (SRBC), but will not be filed with FERC.

³ FERC Accession No.: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20240103-5030

Figure 2.1.1-1. 2024 Average Daily Flow Data USGS Marietta Gage



2.1.2 Water Quality Data

The maximum, average, median, and minimum daily dissolved oxygen concentrations⁴ (mg/L) and water temperature⁵ (°F) collected from the West Fish Lift (WFL) are shown in [Table 2.1.2-1](#) and [Table 2.1.2-2](#), respectively, for the 2024 fish passage season (March 15 through June 1). [Figure 2.1.2-1](#) shows a time series of dissolved oxygen data, and [Figure 2.1.2-2](#) contains a time series of recorded water temperature data. All water quality values are contained in [Appendix B](#).

Table 2.1.2-1. Summary of 2024 Dissolved Oxygen Data

Period	Maximum Daily Dissolved Oxygen (mg/L)	Average Daily Dissolved Oxygen (mg/L)	Median Daily Dissolved Oxygen (mg/L)	Minimum Daily Dissolved Oxygen (mg/L)
March 15 - June 1, 2024	14.0	10.5	10.7	6.8

⁴ Beginning May 1 and for the remaining portion of the 2024 fish passage season, dissolved oxygen values were recorded on a 30-minute interval at Monitoring Station 643 located in the Conowingo tailrace, approximately 0.6 miles downstream from the dam. Station 643 water quality data is included in [Appendix B](#). Dissolved oxygen data recorded from the USGS Susquehanna River at Darlington, MD gage (USGS 01579550), located approximately 2.5 miles downstream from the dam, is additionally provided in [Appendix B](#).

⁵ For the entire 2024 fish passage season, temperature values and dissolved oxygen concentrations were recorded once daily by a grab sample just outside the WFL upstream entrance gate in the Unit 1 discharge area (at 11:00 daily). Water temperature data recorded from the USGS Susquehanna River at Darlington, MD gage (USGS 01579550) is additionally provided in [Appendix B](#).

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Table 2.1.2-2. Summary of 2024 Water Temperature Data

Period	Maximum Daily Water Temperature (°F)	Average Daily Water Temperature (°F)	Median Daily Water Temperature (°F)	Minimum Daily Water Temperature (°F)
March 15 - June 1, 2024	78.1	59.5	57.9	46.0

Figure 2.1.2-1. 2024 Dissolved Oxygen Data

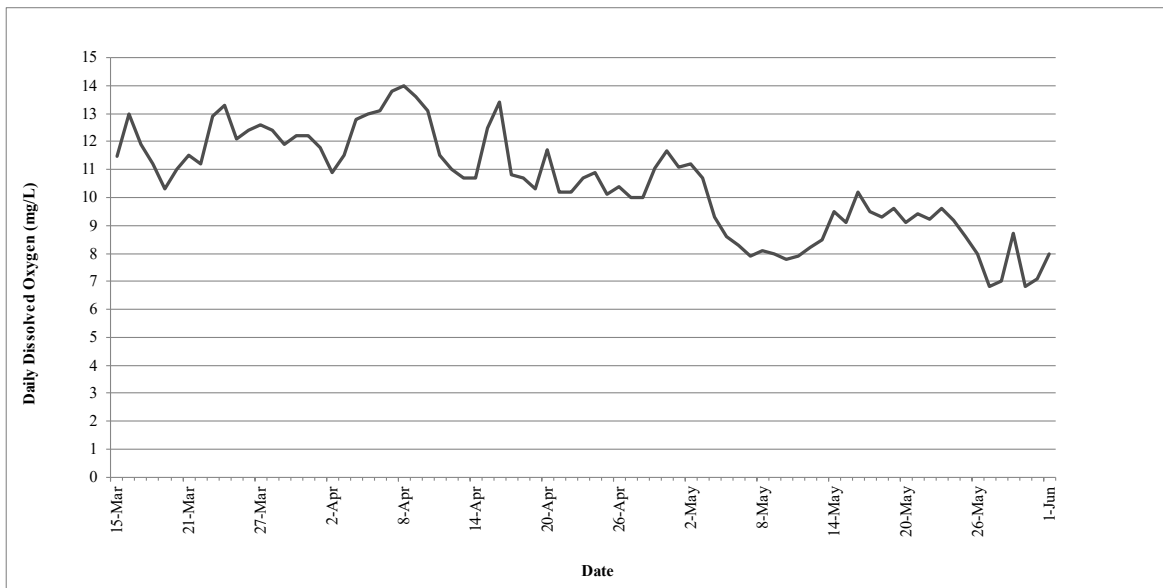
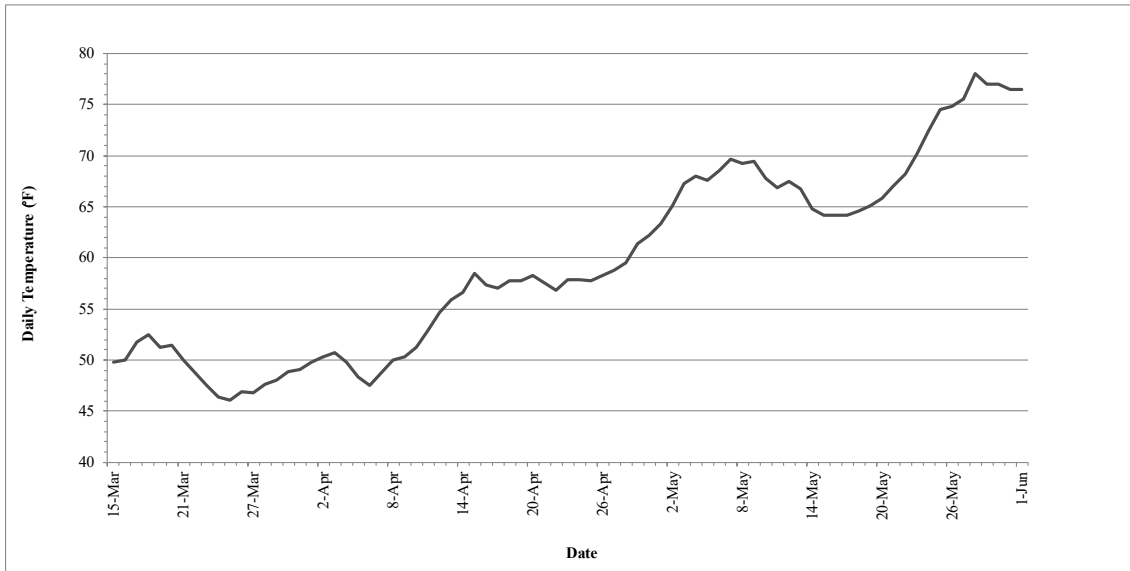


Figure 2.1.2-2. 2024 Water Temperature Data



2.1.3 Project Operations Data

Hourly individual turbine unit operations information, recorded as part of Project operations data, is provided in [Appendix C](#). For each hourly increment throughout the 2024 fish passage season, the operational status of each turbine is presented as “on” or “off”. Turbines generally began or ended their operation at or near the end of hourly intervals. In instances where turbines are operated less than 30 minutes throughout an hourly period, they are considered “off”.

The planned sequences of turbine operation are provided in [Table 2.1.3-1](#) and [Table 2.1.3-2](#) below. The Standing Orders to Operations, dated March 6, 2024, specifies the preferential unit operating schedule during the 2024 fish passage season as well as the defined hours of operation for each month during the fish passage season ([Table 2.1.3-3](#)). As stated in the January 31, 2023, FOMP, the schedule may be altered based on unit outages and other operational requirements. Changes from the unit sequence due to operation or maintenance occurred in approximately 45% of operating hour time intervals (484 of 1,071 hourly intervals) during the 2024 fish season.⁶ The following maintenance outages ([Table 2.1.3-4](#)) accounted for approximately 89% of the changes from the unit sequence (432 of 484 hourly intervals).

Table 2.1.3-1. Turbine Operating Sequence (March 6 – June 1, 2024)

Sequence ON/OFF	Unit No. ON	Unit No. OFF
1 st	5**	1
2 nd	7	2
3 rd	3	4
4 th	6	8
5 th	11	9

⁶ The WFL ran for 799 hours and 23 minutes of total time and reflect partial hourly intervals (e.g., end time at 1603 hours), however the turbine operation data reflect whole hourly intervals (e.g., end time at 1700 hours).

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Sequence ON/OFF	Unit No. ON	Unit No. OFF
6 th	9	11
7 th	8	10
8 th	10	6
9 th	4	3
10 th	2**	7
11 th	1	5

***Preferable Unit for minimum flow @ 5,000 cfs = Unit 5 or Unit 6. (#2 Unit may be run in place of #5 Unit for D.O. Compliance if necessary).*

Table 2.1.3-3. Hours of Fish Lift Preferential Operation for Turbine Operating Sequence

Month	Daily Start Time	Daily Stop Time
March	7:00	19:00
April	6:30	19:30
May	6:00	20:00
June	6:00	20:00

Table 2.1.3-4. Maintenance Outages during 2024 Fish Passage Season (March 15 - June 1, 2024)⁷

Unit No.	Outage Start Time	Outage End Time
4 & 5	3/17/2024 12:00	3/17/2024 19:00
5	3/18/2024 7:00	3/18/2024 19:00
4 & 5	3/19/2024 7:00	3/19/2024 19:00
2	3/19/2024 7:00	3/19/2024 10:00
3	3/21/2024 7:00	3/21/2024 19:00
9	3/25/2024 7:00	3/25/2024 8:15
3	3/25/2024 7:00	3/25/2024 19:00
4	3/26/2024 7:00	3/26/2024 19:00
4	3/27/2024 7:00	3/27/2024 19:00
4	3/28/2024 7:00	3/28/2024 19:00
4	3/29/2024 7:00	3/29/2024 16:30
8	3/30/2024 10:00	3/30/2024 19:00
4	4/1/2024 8:00	4/1/2024 19:00

⁷ Note that several of the outage periods listed in Table 2.1.3-4 occurred outside of the normal fish lift operating times. Also, an outage occurrence does not necessarily always translate to a variance from the operating protocol, especially during low flow periods. For example, there could be outage at Unit 3 that occurred during a stable low flow period. During this period, the operating protocol only would have required two other units (5 and 7) to operate continuously, thus no variance would have occurred due to the outage at Unit 3.

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Unit No.	Outage Start Time	Outage End Time
4	4/2/2024 6:30	4/2/2024 19:30
6	4/2/2024 6:30	4/2/2024 11:30
11	4/15/2024 7:30	4/15/2024 19:30
11	4/16/2024 6:30	4/16/2024 16:30
2	4/20/2024 15:00	4/20/2024 19:30
2	4/21/2024 6:30	4/21/2024 19:30
1	4/24/2024 18:00	4/24/2024 19:30
4	4/27/2024 7:00	4/27/2024 19:30
4	4/28/2024 6:30	4/28/2024 19:30
4	4/29/2024 6:30	4/29/2024 19:30
2	4/29/2024 8:00	4/29/2024 19:30
4	4/30/2024 6:30	4/30/2024 19:30
2	4/30/2024 6:30	4/30/2024 19:30
4	5/1/2024 6:00	5/1/2024 20:00
2	5/1/2024 6:00	5/1/2024 20:00
4	5/2/2024 6:00	5/2/2024 20:00
2	5/2/2024 6:00	5/2/2024 10:00
2	5/2/2024 14:00	5/2/2024 20:00
5	5/3/2024 6:00	5/3/2024 20:00
2	5/3/2024 13:10	5/3/2024 20:00
5	5/4/2024 6:00	5/4/2024 20:00
8	5/4/2024 12:00	5/4/2024 20:00
2	5/5/2024 6:00	5/5/2024 20:00
8	5/5/2024 12:00	5/5/2024 20:00
2	5/6/2024 6:00	5/6/2024 20:00
8	5/6/2024 12:15	5/6/2024 20:00
2	5/7/2024 6:00	5/7/2024 9:00
8	5/7/2024 15:00	5/7/2024 20:00
8	5/8/2024 11:00	5/8/2024 19:00
4	5/9/2024 10:15	5/9/2024 20:00
4	5/10/2024 10:00	5/10/2024 20:00
4	5/11/2024 11:00	5/11/2024 20:00
4	5/12/2024 6:00	5/12/2024 20:00
4	5/13/2024 6:00	5/13/2024 16:00
3	5/26/2024 6:00	5/26/2024 12:00
8	5/28/2024 11:00	5/28/2024 17:00
4	5/29/2024 6:00	5/29/2024 8:00
4	5/29/2024 14:00	5/29/2024 20:00
4	5/30/2024 18:00	5/30/2024 20:00

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Unit No.	Outage Start Time	Outage End Time
10	5/30/2024 12:00	5/30/2024 20:00
4	5/31/2024 6:00	5/31/2024 11:00
4	5/31/2024 19:00	5/31/2024 20:00
4	6/1/2024 11:00	6/1/2024 20:00
9	6/1/2024 11:00	6/1/2024 19:00

The hourly individual turbine discharge data and the hourly discharge through the spillway gates for the 2024 American Shad and American Eel passage seasons (March 15-December 3, 2024) is provided in [Appendix C](#). Constellation records the daily average discharge of each individual turbine rather than recording each turbine’s hourly total discharge. Therefore, the discharge data provided is calculated using each turbine’s daily average discharge and the hourly “on” or “off” status. These values were compared to the Project’s recorded hourly total discharge, which is a record of the discharge from the powerhouse and through the spillway and were generally in agreement. However, values were observed differing at the start and end of a turbine’s operational period. This difference is a result of the calculated data incorporating daily average discharge and therefore not capturing the ramping up or down of the turbine as it begins or ends operation. Additionally, values differ during periods of spillage (e.g., April 3 through April 11 and April 13 through April 19, 2024), as the recorded plant discharge includes spillage information.

Minimum flows of 3,500 and 10,000 cfs or natural river flow (whichever is less), as measured at the USGS gage at Marietta, PA were maintained for the periods of March 15 to 31 and April 1 to 30, respectively. A minimum flow of 7,500 cfs or natural river flow (as previously noted) was maintained for the period of May 1 to 31. A minimum flow of 5,000 cfs or natural river flow (as previously noted) was maintained for the period of June 1 to September 14. A minimum flow of 3,500 cfs or natural river flow (as previously noted) was maintained for the period of September 15 to December 3.

2.2 Fish Passage Facilities

2.2.1 Conowingo West Fish Lift

2.2.1.1 Staffing

During the 2024 fish passage facility operating season, trained and qualified individuals were on site to operate the WFL. The WFL operating crew included a supervising biologist, lift operator, and biological technicians. All fishway operational personnel reviewed and understood the FOMP.

The supervising biologists and lift operators were responsible for operating mechanical and electrical equipment associated with the WFL. The lift operators set the equipment as directed by the supervising biologist. The lift operators adjusted equipment settings throughout the course of each day as hydraulic conditions changed so attraction flows from, and in, the WFL were optimized. The supervising biologists provided technical guidance on all aspects of daily operation at the WFL and were responsible for fine tuning the operation to assure the best possible efficiency. In addition, the supervising biologist was responsible for establishing fishing time and lift frequency, and mobilizing transport units and personnel, which is based on fish abundance that can change throughout the day and the season. The supervising biologist oversaw the collection of all data, ensured their accuracy, and produced and distributed a daily report via email to all pertinent Constellation and Resource Agency personnel at the end of each day.

2.2.1.2 Maintenance

Pre-season maintenance and post-season maintenance measures took place as outlined in the January 31, 2023, version of the FOMP.

Constellation utilizes an electronic work management platform to manage maintenance tasks including tasks associated with the pre-season and post-season maintenance activities of the fish passage facilities. Several tasks are set up in the work orders for pre- and post-season maintenance. Completion of activities is recorded in the work management system as well as any findings and follow-up required. Work orders are included in [Appendix D](#) and are scheduled well in advance of the completion date to allow time for vendors to be on-site. Pre-season and post-season maintenance checklists from this work management platform were completed in accordance with the FOMP.

2.2.1.3 Operation

Throughout the 2024 season, the WFL supervising biologist notified pertinent Station personnel of the WFL crew arrival each day, conducted a pre-job safety briefing, and informed the Station that WFL operations will commence. The 2024 fish passage season at the WFL began on March 16 and continued through June 1.⁸ The WFL operated for a total of 799 hours and 23 minutes over 62 days and completed 1,317 lifts for the 2024 season ([Table 2.2.1.3-1](#)). The hours of daily operation, including the starting and ending time of daily fish operations, are listed in [Appendix E](#).

Table 2.2.1.3-1. Summary of Operations at the Conowingo West Fish Lift, March 16 – June 1, 2024

Total Number of Days Operations Occurred	Total Time of Operation (hr:min)	Total Number of Lifts Operated
62	799:23	1,317

2.2.1.3.1 Fish Counts, Transport, and Stocking

A total of 247,983 fish of 40 species along with one (1) Tiger Trout (*Salmo trutta* × *Salvelinus fontinalis*), seven Splake (*Salvelinus namaycush* × *Salvelinus fontinalis*), four (4) Tiger Muskellunge (*Esox masquinongy* × *Esox Lucius*) and two (2) hybrid Striped Bass (*Morone saxatilis*) hybrids were collected and identified in the WFL sorting tank. [Figure 2.2.1.3.1-1](#) graphically presents the daily catch of American Shad at the WFL versus dissolved oxygen and water temperature recorded at the Project.

Target native and non-native fish counts are summarized in [Table 2.2.1.3.1-1](#). Of the 1,149 target native species collected, 1,106 were American Shad, 21 were Alewife, and 22 were Blueback Herring. Of the 1,106 American Shad, 20 were sacrificed and there was a total of 13 mortalities. All target non-native species collected were sacrificed. No Silver Carp (*Hypophthalmichthys molitrix*), Bighead Carp (*Hypophthalmichthys nobilis*), Grass Carp (*Ctenopharyngodon idella*), or Freshwater Drum (*Aplodinotus grunniens*) were observed at the WFL. The count of all fish species captured at the lift are additionally contained in [Appendix E](#).⁹ Throughout the 2024 season, the WFL hopper had an overall average fullness of 23.4%. Hopper fullness data for each individual lift as well as a breakdown of fullness percentages is provided in [Appendix E](#). [Figure 2.2.1.3.1-2](#) provides the daily shad catch at the WFL compared to the proportion of WFL lifts in that day that had a hopper fullness level of 75% or more.

⁸ The WFL did not operate on April 2-April 17.

⁹ During trap and transport operations, the counts are recorded per each lift, not by the hour.

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The number of fish species trapped and transported, including date, time, and location of release is additionally provided in [Appendix F](#).

During the 2024 season, the WFL collected two American Shad (*Alosa sapidissima*) that were previously captured, Floy-tagged and released downstream of Conowingo Dam by the Maryland Department of Natural Resources (MDNR). Per the FOMP operational guidelines, all re-captured MDNR tagged American Shad from the current year (2024) are to be transported upriver. Any MDNR tagged American Shad collected from previous years (prior to 2024) are to be sacrificed for study. A summary of Floy-tagged American Shad collected at the WFL is provided in [Table 2.2.1.3.1-2](#).

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Table 2.2.1.3.1-1. Conowingo West Fish Lift Counts, March 16 - June 1, 2024

Species	Total Collected	Percent of Total Collected	Total Transported	Total Stocked	Total Sacrificed	Holding Mortalities	Lift Mortalities	Transport Mortalities
<i>Target Native Species</i>								
Alewife	21	< 0.1	12	11	0	0	0	1
American Shad	1,106	0.4	840	838	20	6	5	2
Blueback Herring	22	< 0.1	20	20	0	0	0	0
<i>Target Non-native Species</i>								
Blue Catfish	36	< 0.1	0	0	36	n/a	n/a	n/a
Flathead Catfish	750	0.3	0	0	750	n/a	n/a	n/a
Northern Snakehead	1,965	0.8	0	0	1,961	n/a	n/a	n/a
<i>Dominant Species</i>								
Gizzard Shad	231,212	93.2	0	0	n/a	n/a	n/a	n/a
Channel Catfish	5,582	2.3	0	0	n/a	n/a	n/a	n/a
Shorthead Redhorse	3,224	1.3	0	0	n/a	n/a	n/a	n/a
<i>All Species</i>	247,983							

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Table 2.2.1.3.1-2. Summary of Floy-tagged American Shad Collected at the Conowingo West Fish Lift, March 15- June 1, 2024

Tag Number	Sex of Fish	Date Tagged¹⁰	Date Collected	Days at Large	Disposition
012620	M	5/2/2024	5/8/2024	6	Transported
012599	F	5/1/2024	5/11/2024	10	Transported

¹⁰ Date Floy tagged provided by Maryland Department of Natural Resources (MDNR).

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Figure 2.2.1.3.1-1. Daily American Shad Catch at the West Fish Lift Versus Water Temperature and Dissolved Oxygen Recorded at the Conowingo Dam

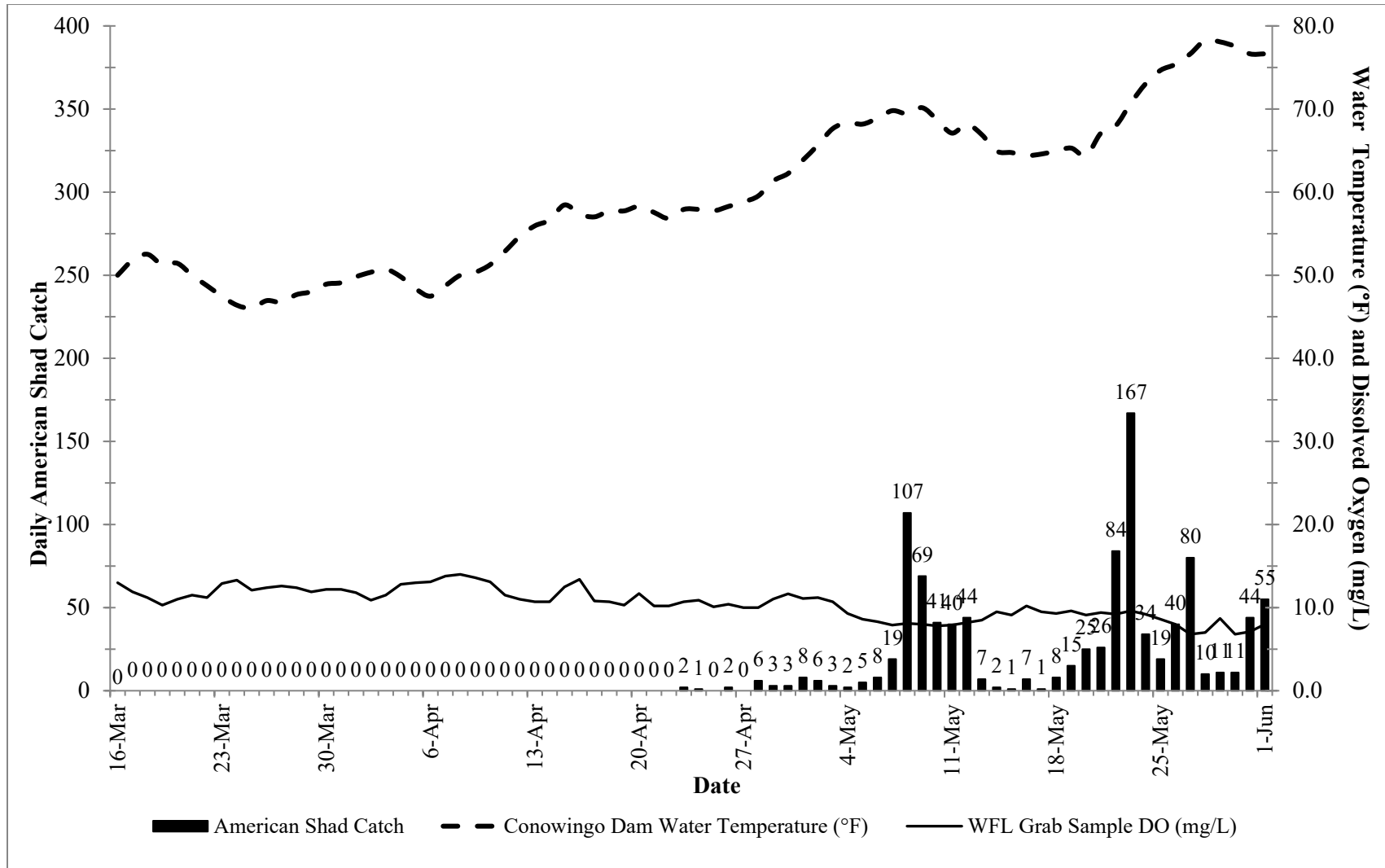
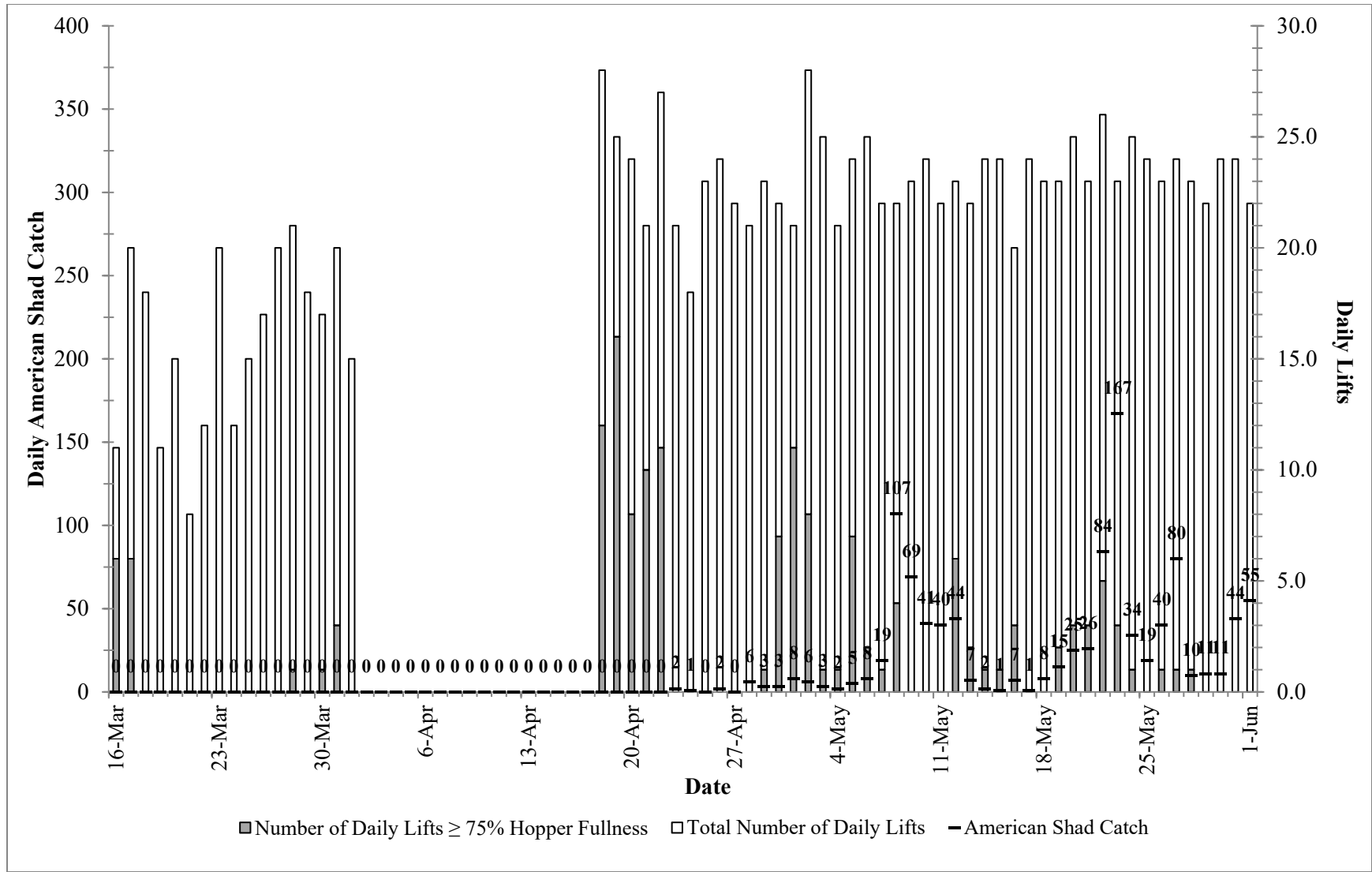


Figure 2.2.1.3.1-2. Daily American Shad Catch at the West Fish Lift Compared to the Proportion of Daily Lifts That Had a Hopper Fullness Level of 75% or More



2.2.1.4 Biological Sampling

Life history information (length, weight, sex, spawning condition, scales and otolith samples) was taken from American Shad that were sacrificed or died (lift, holding, or transport mortalities). During the 2024 season, a total of five (5) lift mortalities, six (6) holding mortalities, and two (2) transport mortalities of American Shad occurred at WFL ([Table 2.2.1.3.1-1](#)). A total of 20 American Shad were sacrificed from the WFL catch for life history information, comprised of 12 males and eight females.

A small number of river herring [21 Alewife and 22 Blueback Herring] were collected during the 2024 season. There was one (1) Alewife and one (1) Blueback Herring sacrificed from the WFL catch for life history information in 2024.

The collected biological sampling information from sacrificed adult American Shad and river herring is provided in [Appendix G](#). Additionally, summaries of American Shad mortalities are included in [Appendix E](#).

2.2.2 *Conowingo East Fish Lift*

2.2.2.1 Staffing

During the 2024 fish passage facility operating season, trained and qualified individuals were on site to operate the East Fish Lift (EFL). The EFL operating crew included a supervising biologist, lift operator, and biological technicians. All fishway operational personnel reviewed and understood the FOMP.

The supervising biologists and lift operators were responsible for operating mechanical and electrical equipment associated with the EFL. The lift operators set the equipment as directed by the supervising biologist. The lift operators adjusted equipment settings throughout the course of each day as hydraulic conditions changed so attraction flows from, and in, the EFL were optimized. The supervising biologists provided technical guidance on all aspects of daily operation at the EFL and were responsible for fine tuning the operation to assure the best possible efficiency. In addition, the supervising biologist was responsible for establishing fishing time and lift frequency, and mobilizing transfer units and personnel, which is based on fish abundance that can change throughout the day and the season. The supervising biologist oversaw the collection of all data, ensured their accuracy, and produced and distributed a daily report via email to all pertinent Constellation and Resource Agency personnel at the end of each day.

2.2.2.2 Maintenance

Pre-season maintenance and post-season maintenance measures took place as outlined in the January 31, 2023, version of the FOMP.

Constellation utilizes an electronic work management platform to manage maintenance tasks including tasks associated with the pre-season and post-season maintenance activities of the fish passage facilities. Several tasks are set up in the work orders for pre- and post-season maintenance. Completion of activities is recorded in the work management system as well as any findings and follow-up required. Work orders are included in [Appendix D](#) and are scheduled well in advance of the completion date to allow time for vendors to be on-site. Pre-season and post-season maintenance checklists from this work management platform were completed in accordance with the FOMP.

2.2.2.3 Operation

Throughout the 2024 season, the EFL supervising biologist notified pertinent Station personnel of the EFL crew arrival each day, conducted a pre-job safety briefing, and informed the Station that EFL operations will commence. The 2024 fish passage season at the EFL began on March 15 and continued through May

17.¹¹ The EFL operated for a total of 518 hours and 52 minutes over 45 days and completed 898 lifts for the 2024 season ([Table 2.2.2.3-1](#)). The hours of daily operation, including the starting and ending time of daily fish operations, are listed in [Appendix E](#).

On April 12, 2024, the EFL Crowder Screen was severely damaged due to operator error, causing the EFL to not operate from April 13 through April 24, 2024. Operation to the EFL was suspended from April 14-16, 2024, due to high flows, which also prevented the Conowingo Maintenance Staff from assessing the damage. Due to the damage incurred, the Crowder Screen was removed out of the way of the operation and the cable was removed from the drum, allowing the operation of the EFL to come back into service on April 25, 2024. However, operating the EFL in this manner resulted in the crowder door being closed for 13 minutes compared to the original operation of having the crowder door closed for 3 minutes. The EFL’s attraction flow was still in agreement with operating specifications and there were no fish observed stressed, injured, or dead on the crowder doors or within the crowder channel due to the lack of a Crowder Screen. On May 17, the EFL was damaged due to operator error and was subsequently out of service for the remainder of the 2024 fish passage season.

Table 2.2.2.3-1. Summary of Operations at the Conowingo East Fish Lift, March 15 – May 17, 2024

Total Number of Days Operations Occurred	Total Time of Operation (hr:min)	Total Number of Lifts Operated
45	518:52	898

2.2.2.3.1 Fish Counts, Transport, and Stocking

A total of 826,767 fish of 31 species as well as one (1) Splake and one (1) Striped Bass hybrid were collected and identified in the EFL sorting tank during the 2024 season. Gizzard Shad (821,030), American Shad (1,621), and Channel Catfish (1,445) dominated the catch and comprised nearly 99.7% of the total fish collected. Gizzard Shad alone accounted for nearly 99.3% of the total fish collected. [Figure 2.2.2.3.1-1](#) graphically presents the daily catch of American Shad at the EFL versus dissolved oxygen and water temperature recorded at the Project.

Target native and non-native fish counts are summarized in [Table 2.2.2.3.1-1](#). Of the 1,658 target native species collected, 32 American Shad and one (1) Blueback Herring were sacrificed and there was a total of 22 mortalities. All target non-native species collected were sacrificed. There were no Silver Carp, Bighead Carp, Grass Carp, or Freshwater Drum observed at the EFL. The count of all fish species captured at the lift are additionally contained in [Appendix E](#).¹² Throughout the 2024 season, the EFL hopper had an overall average fullness of 36.0%. Hopper fullness data for each individual lift as well as a breakdown of fullness percentages is provided in [Appendix E](#). [Figure 2.2.2.3.1-2](#) provides the daily shad catch at the EFL compared to the proportion of EFL lifts in that day that had a hopper fullness level of 75% or more.

The number of fish species trapped and transported, including date, time, and location of release is additionally provided in [Appendix F](#).

¹¹ The EFL did not operate on March 28 due to sorting tank chute repair, April 4-9 and April 13-16 due to high river flow, and April 17-24 due to damage/repair of the Crowder Screen.

¹² During trap and transport operations, the counts are recorded per each lift, not by the hour.

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During the 2024 season, the EFL collected three (3) American Shad that were previously captured, Floy-tagged and released downstream of Conowingo Dam by MDNR in 2024. There were no Floy-tagged American Shad collected from previous years (prior to 2024). Per the 2023 FOMP operational guidelines, all re-captured MDNR tagged American Shad from the current year (2024) are to be transported upriver. Any MDNR tagged American Shad collected from previous years (prior to 2024) are to be sacrificed for study. Therefore, no MDNR tagged American Shad collected in 2024 were sacrificed. A summary of Floy-tagged American Shad collected at the EFL is provided in [Table 2.2.2.3.1-2](#).

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Table 2.2.2.3.1-1. Conowingo East Fish Lift Counts, March 15 – May 17, 2024

Species	Total Collected	Percent of Total Collected	Total Transported	Total Stocked	Total Sacrificed	Holding Mortalities	Lift Mortalities	Transfer Mortalities
<i>Target Native Species</i>								
Alewife	2	<0.01%	2	2	0	0	0	0
American Shad	1,621	0.20%	1,522	1,522	32	8	7	7
Blueback Herring	35	<0.01%	34	34	1	0	0	0
<i>Target Non-native Species</i>								
Northern Snakehead	119	0.01%	0	0	119	n/a	n/a	n/a
<i>Dominant Species</i>								
Gizzard Shad	821,030	99.31%	0	0	n/a	n/a	n/a	n/a
Channel Catfish	1,445	0.17%	0	0	n/a	n/a	n/a	n/a
Smallmouth Bass	723	0.09%	0	0	n/a	n/a	n/a	n/a
<i>All Species</i>	826,767							

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Table 2.2.2.3.1-2. Summary of Floy-tagged American Shad Collected at the Conowingo East Fish Lift, March 15 – May 17, 2024

Tag Number	Sex of Fish	Date Tagged¹³	Date Collected	Days at Large	Disposition
12463	F	4/25/2024	5/6/2024	11	Transported
12628	F	5/2/2024	5/7/2024	5	Transported
12484	M	4/29/2024	5/7/2024	8	Transported

¹³ Date Floy tagged provided by Maryland Department of Natural Resources (MDNR).

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Figure 2.2.2.3.1-1. Daily American Shad catch at the East Fish Lift Versus Water Temperature and Dissolved Oxygen Recorded at the Conowingo Dam

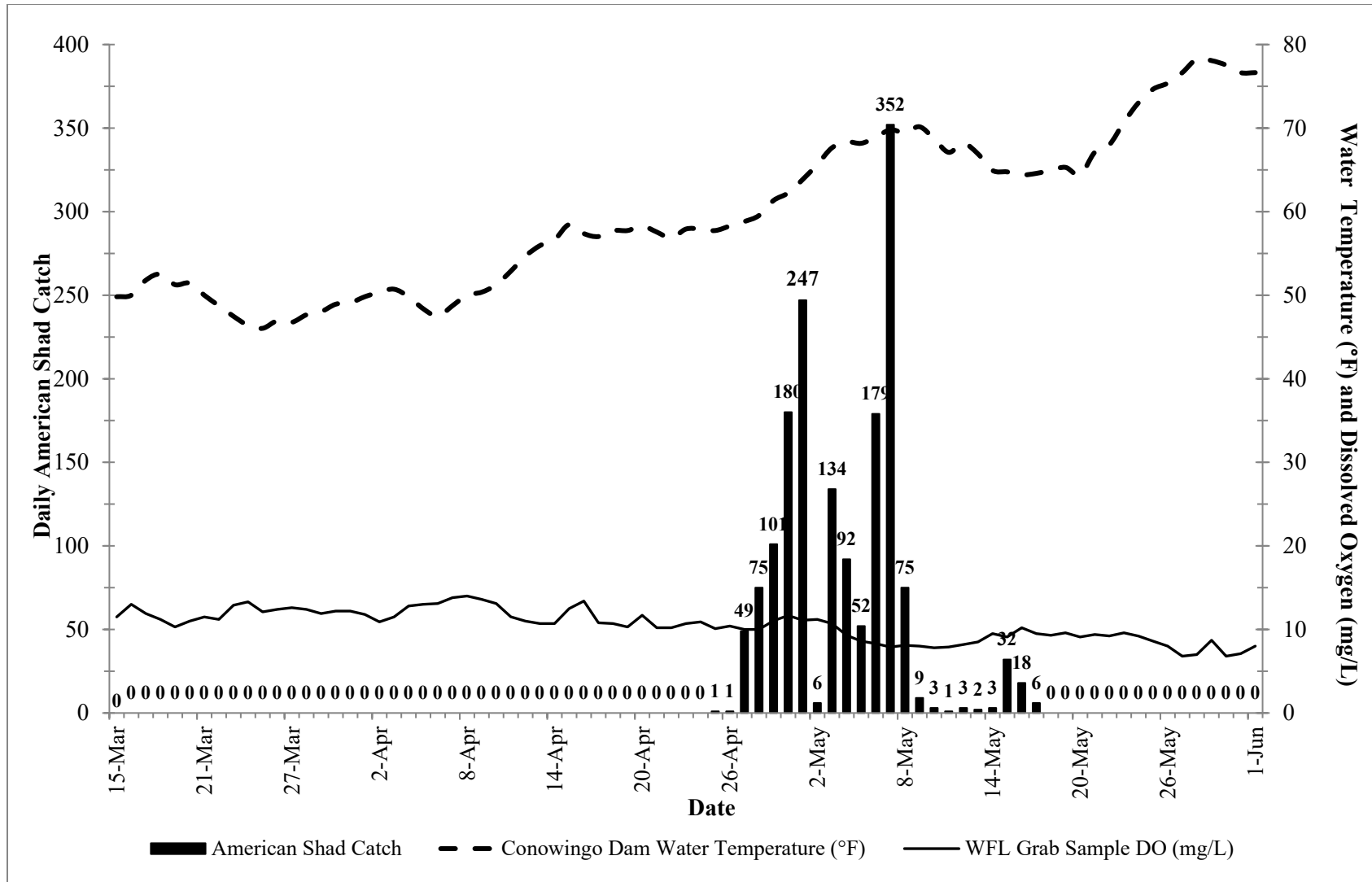
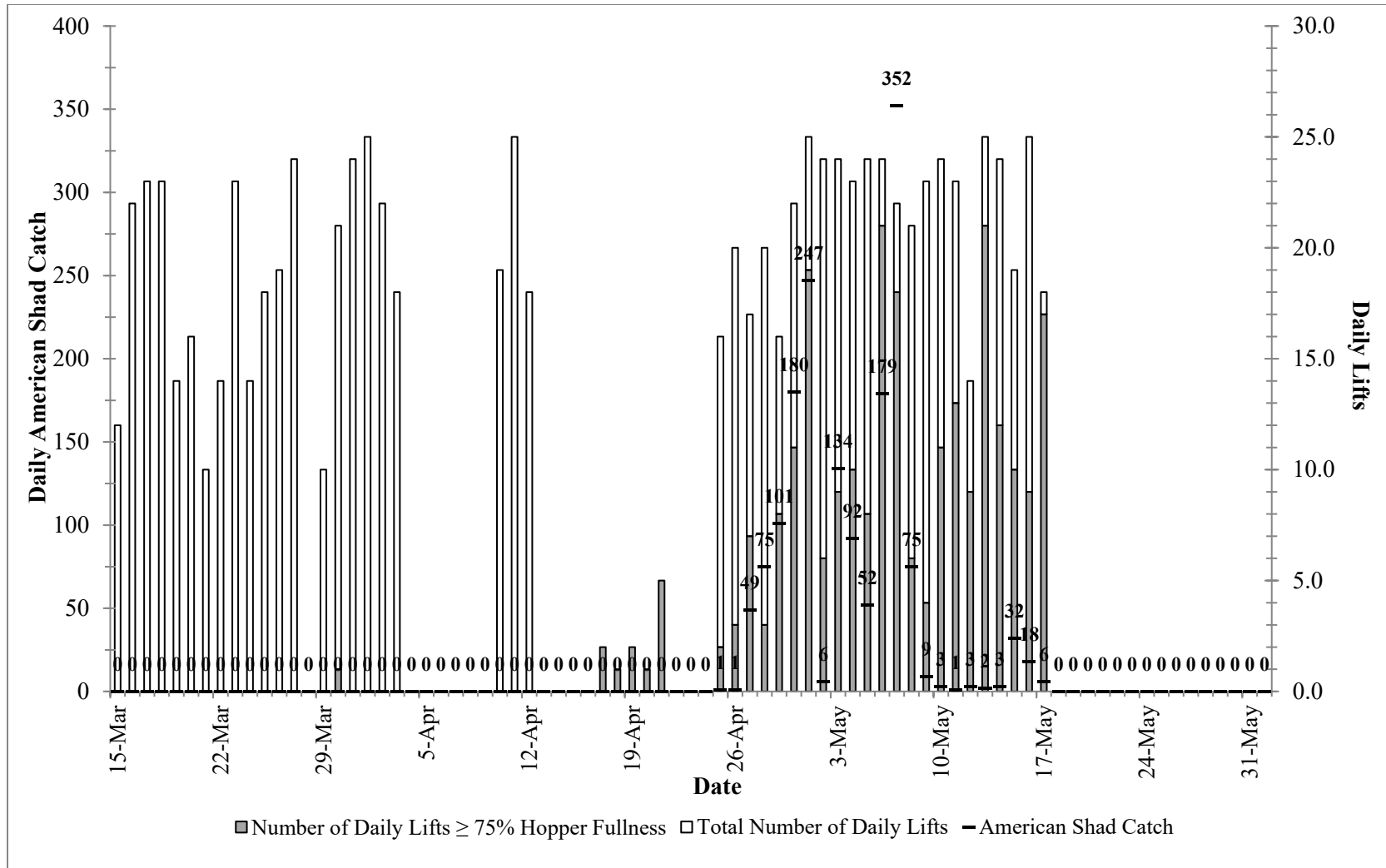


Figure 2.2.2.3.1-2. Daily American Shad Catch at the East Fish Lift Compared to the Proportion of Daily Lifts That Had a Hopper Fullness Level of 75% or More



2.2.2.4 Biological Sampling

Life history information (length, weight, sex, spawning condition, scales and otolith samples) was taken from American Shad that were sacrificed or died (lift, holding, or transfer mortalities). During the 2024 season, a total of seven (7) lift mortalities, eight (8) holding mortalities, and seven (7) transfer mortality of American Shad occurred at EFL. A total of 32 American Shad were sacrificed from the EFL catch for life history information. There were no sacrificed MDNR Floy-tagged American Shad that were collected in 2024. The sacrificed American Shad were comprised of 16 males and 16 females.

Several river herring (2 Alewife and 35 Blueback Herring) were collected during the 2024 season. No Alewife were sacrificed from the EFL catch for life history information, as the minimum number to warrant a sacrifice was not reached. One (1) male Blueback Herring was sacrificed from the EFL catch for life history information.

The collected biological sampling information from sacrificed adult American Shad and river herring is provided in [Appendix G](#). Additionally, summaries of American Shad mortalities are included in [Appendix E](#).

2.2.3 *Conowingo West Eel Collection Facility*

The Conowingo West Eel Collection Facility (CWECEF) was operated as described in the January 31, 2023, FOMP. Operation began on May 1, 2024, and continued to December 3, 2024.

2.2.3.1 Staffing

Trained and qualified individuals operated the facility throughout the eel passage season. A supervising biologist oversaw all operations with the assistance of biologists and biological technicians. Daily facility checks were completed by a crew of two trained personnel. All personnel had reviewed and understood the FOMP.

2.2.3.2 Maintenance

Pre-season Maintenance

In April 2024, all eel passage facility components, including the eel ramp, collection, overflow, and holding tanks, as well as the associated water lines were installed and tested. All components were in working order before the facility was placed into service on May 1, 2024.

Post-season Maintenance

After the season ended on December 3, 2024, the eel facility components were dismantled, cleaned and stored. The collection, overflow, and holding tanks, as well as the water lines were stored appropriately for the winter period.

2.2.3.3 Operation

Throughout the 2024 season, the eel passage facility monitoring crew notified pertinent Station personnel of their arrival each day, conducted a pre-job safety briefing, informed the Station that eel passage operations will commence, and asked for a dissolved oxygen (DO) tailrace reading prior to November 1, 2024, and if any issues have been recorded since completion of the last eel passage facility check.¹⁴

¹⁴ Between November 1 and December 3, DO readings were obtained from the Shures Landing boat ramp as Station 643 was not in service after October 31, 2024.

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Flow rates for the trapping, collecting, and holding processes are the primary metric used to evaluate whether the facility is operating within design parameters. If flows are within the design parameters, then the facility would be operating properly. Additionally, continuous measurements of water temperature and dissolved oxygen as well as visual inspections during daily operation determine if the facility is operating normally and that conditions are suitable for collecting and holding juvenile eels. The continuous monitors are equipped with alarms that alert personnel when any of the measured parameters are not within the design parameters. The proper operation of the continuous monitors and associated alarms was verified regularly. When daily eel sampling was complete, the eel passage facility monitoring crew notified pertinent Station personnel of any major changes to the facility and that the crew is leaving the site.

There were no significant problems encountered with the trapping, collecting, or holding systems. The total attraction flow of the facility varied throughout the season dependent upon which tanks were in-service, but an attraction flow was always being discharged down the ramp and shoreline. Periodically throughout the season, low flow alarms did occur. Slight adjustments made to the individual tank feed pipes to adjust the output to these feed pipes to obtain a constant water flow into the tanks resolved this issue. Cleaning and calibration activities were conducted at least weekly during the season. [Table 2.2.3.3-1](#) provides a summary of the alarm notifications and corrective action taken during the season.

The statistics of the operational parameters for the main components of the CWECF are provided in [Table 2.2.3.3-2](#). The total attraction flow, collection tank fill, and collection tank drain information was collected as part of the calibration of flows at the CWECF. Calibration of the ramp flow was executed each week after cleaning, using a 19-L graduated bucket. Multiple locations at the facility were checked for calibration purposes - the spray bar, the collection tank fill and drain, scent line, and the drains of each of the holding tanks that were in-service. Some of the water from the spray bar that was not used for attracting eels up the ramp but used to help slide eels into the collection tank was identified as the backside of ramp flow. The backside of ramp flow was calculated by adding the scent line to the collection tank drain and subtracting the collection tank fill. The attraction flow at the top of the ramp (top attraction) was calculated by subtracting the backside of ramp flow from the spray bar amount. Bottom of ramp attraction is a sum of the collection tank drain and the drains of the in-service holding tanks. Total attraction flow is equal to the collection tank fill, the spray bar and the drains of the holding tanks. Details and calibration records are provided in [Appendix H](#). After calibration readings were taken adjustments, if necessary, were made to the facility to ensure that at least 70 gallon per minute (gpm) of attraction flow was provided.

Daily temperature measurements were taken in the CWECF collection tank and the dissolved oxygen records were collected from the Project control room (Station 643).¹⁵

Table 2.2.3.3-1. Conowingo West Eel Collection Facility 2024 Alarms and Corrective Actions

Date	Time	Alarm	Corrective Action
6/4/2024	0513	Low Flow, Holding Tank 1	False reading for this tank was not being used
6/8/2024	1042	Low Flow, Holding Tank 2	Adjusted flow rate prior into this tank
6/8/2024	1320	Low DO, Holding Tank 2	Changed oxygen bottle
6/10/2024	1158	Low DO, Collection Tank	Increase oxygen flow rate into tank

¹⁵ Between November 1 and December 3, DO readings were obtained from the Shures Landing boat ramp as Station 643 is not in service after October 31, 2024.

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Date	Time	Alarm	Corrective Action
6/15/2024	0805	Calibration Error	False reading during station calibration
6/15/2024	0808	Calibration Error	False reading during station calibration
6/21/2024	0805	Low DO, Collection Tank	NAI Changing oxygen bottle
6/26/2024	0249	Low DO, Collection Tank	Changed oxygen bottle
6/27/2024	0411	Low DO, Collection Tank	Increase oxygen flow rate into tank
6/29/2024	1646	Low Flow, Collection Tank	Increase water flow into tank
6/30/2024	0230	Low Flow, Collection Tank	Increase water flow into tank
7/4/2024	2025	Low Flow, Collection Tank	Increase water flow into tank
7/7/2024	0150	Low Flow, Collection Tank	Increase water flow into tank
8/25/2024	0610	False Reading	Power glitch
9/14/2024	1128	Low DO, Collection Tank	Increase oxygen flow rate into tank
10/1/2024	0650	Low Flow, Collection Tank	Increase water flow into tank
10/2/2024	0655	Low Flow, Holding Tank 1	Increase water flow into tank
10/7/2024	0036	Low Flow, Holding Tank 1	Increase water flow into tank
10/11/2024	0648	Low Flow, Collection Tank	Increase water flow into tank
11/2/2024	2241	Low Flow, Holding Tank 2	Increase water flow into tank
11/5/2024	2146	Low Flow, Holding Tank 2	Increase water flow into tank

Table 2.2.3.3-2. Conowingo West Eel Collection Facility 2024 Operations Summary

Operational Parameter	Maximum Value	Average Value	Minimum Value
Total Attraction Flow (gpm)	42.0	63.3	89.3
Collection Tank Fill (gpm)	8.5	12.6	17.5
Collection Tank Drain (gpm)	7.5	13.7	20.3
Collection Tank Temperature (°F)	8.5	24.2	32.3
Dissolved Oxygen at Station 643 (mg/L)	6.0	8.7	12.3

2.2.3.3.1 Eel Counts, Transport and Stocking

A total of 371,655 American Eel (*Anguilla rostrata*) were collected and 370,110 were stocked from the CWECF during the 2024 season. When including the 84,895 American Eel captured at the Octoraro Creek

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Eel Collection Facility (OCECF) and transported to the CWECF, a total of 455,001 American Eel were stocked within the Susquehanna River watershed in 2024. [Figure 2.2.3.3.1-1](#) provides a summary of the annual American Eel catches at the CWECF from the 2017 through 2024 seasons. There was a total of 71 (0.02% mortality) juvenile eels observed dead during collection and 639 (1.12% mortality) juvenile eels that were recovered dead from the holding tanks over the entire 2024 season¹⁶. A total of 600 eels were removed by the Susquehanna River Basin Commission (SRBC) to be used in their Eels in the Classroom program, in which SRBC provides juvenile American eels to educators to raise in their classrooms and ultimately release back into the Susquehanna River. [Table 2.2.3.3.1-1](#) summarizes the CWECF counts.

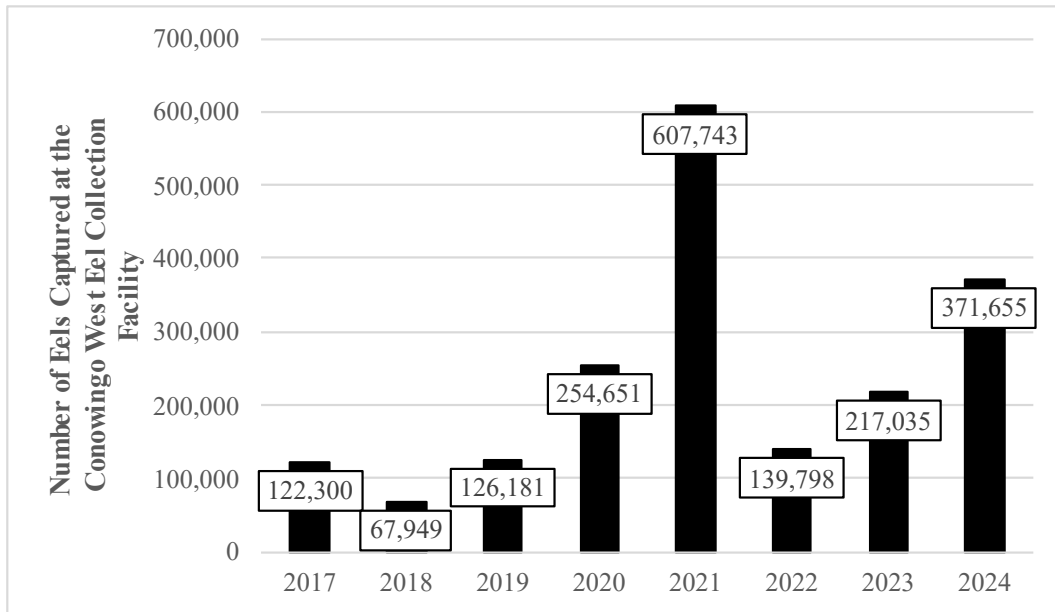
The CWECF data required as part of this annual report (i.e., the estimated number of juvenile eels captured each day, number of eels in the holding tanks, and calibration records) has been extracted from the 2024 Conowingo West Eel Collection Facility report and are provided in [Appendix I](#).

Table 2.2.3.3.1-1. Conowingo West Eel Collection Facility Counts, May 1 – December 3, 2024

Total Collected at CWECF	Total Transported to CWECF from OCECF	Collection Mortalities	Holding Mortalities	Transport Tank Mortalities	Sacrificed for Analysis	Removed by SRBC	Total Stocked
371,655	84,891	71	639	135	100	600	455,001

¹⁶ The original collection location of mortalities is not able to be identified as eels from both the CWECF and OCECF are combined in the holding tank.

Figure 2.2.3.3.1-1. Annual Number of Eels Captured at the Conowingo West Eel Collection Facility, 2017-2024



3 VARIATIONS FROM THE FOMP

Aside from the changes in turbine operation sequence noted in [Section 2.1.3](#) and the complications associated with the damage to the EFL described in [Section 2.2.2.3](#), the Conowingo upstream fish passage facilities experienced no variations from the approved January 31, 2023 FOMP during the 2024 fish passage season, and operations and maintenance of the facilities were conducted in conformance with the FOMP.

4 PROPOSED MODIFICATIONS

During the 2025 fish passage season, Constellation will continue to provide trap and transport operations from the EFL and employ sorting protocols to remove aquatic invasive species in lieu of volitional passage at EFL. In 2025, fish passage operations will be undertaken consistent with the annual license and 1989 fish passage settlement rather than the January 31, 2023 FOMP. As a result, the EFL is to operate between 0800 and 1800 starting April 1, 2025, and operate every other day. The EFL will begin daily operation when five American Shad or river herring are caught in a single day and end no later than June 10, 2025. As per the terms of the annual license and 1989 fish passage settlement, Constellation will not operate the WFL during the 2025 fish passage season.

On January 23, 2025, Constellation filed an additional notification with FERC detailing operation of the 2025 fish passage season.¹⁷

The following aquatic invasive species, Northern Snakehead (*Channa argus*), Blue Catfish (*Ictalurus furcatus*), Flathead Catfish (*Pylodictis olivaris*), Freshwater drum (*Aplodinotus grunniens*), Alabama Bass (*Micropterus henshalli*), Silver Carp (*Hypophthalmichthys molitrix*), Bighead Carp (*Hypophthalmichthys*

¹⁷ FERC Accession No.: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20250123-5111

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nobilis), and Grass Carp (*Ctenopharyngodon idella*) will be collected from the EFL and placed in totes and a freezer provided by the MDNR and taken off site by MDNR.

5 REFERENCES

- Exelon Generation Company, LLC. (2016). *Conowingo Hydropower Project Settlement Agreement Between Exelon Generation Company, LLC and the United States Department of the Interior Fish & Wildlife Service*.
- Exelon Generation Company, LLC and the Maryland Department of the Environment. (2019). *Joint Offer of Settlement and Explanatory Statement Of Exelon Generation Company, LLC and the Maryland Department of the Environment*.
- Federal Energy Regulatory Commission. (2015). *Final Multi-Project Environmental Impact Statement For Hydropower Licenses*. Federal Energy Regulatory Commission, Office of Energy Projects, Division of Hydropower Licensing. Washington, DC: Federal Energy Regulatory Commission.

**APPENDIX A. SUSQUEHANNA RIVER STREAM FLOW DATA USGS MARIETTA
GAGE**

Appendix A. Flow Data USGS Marietta Gage

Date	Average Daily Flow (cfs) (USGS Marietta Gage)
3/15/2024	95,700
3/16/2024	81,100
3/17/2024	71,300
3/18/2024	64,100
3/19/2024	57,900
3/20/2024	53,100
3/21/2024	48,400
3/22/2024	45,000
3/23/2024	45,200
3/24/2024	49,700
3/25/2024	51,900
3/26/2024	53,900
3/27/2024	50,200
3/28/2024	46,800
3/29/2024	45,000
3/30/2024	44,300
3/31/2024	44,400
4/1/2024	44,600
4/2/2024	54,300
4/3/2024	113,000
4/4/2024	237,000
4/5/2024	287,000
4/6/2024	245,000
4/7/2024	184,000
4/8/2024	146,000
4/9/2024	120,000
4/10/2024	102,000
4/11/2024	88,200
4/12/2024	79,100
4/13/2024	108,000
4/14/2024	155,000
4/15/2024	150,000
4/16/2024	132,000
4/17/2024	112,000
4/18/2024	95,100
4/19/2024	84,800
4/20/2024	78,400
4/21/2024	72,800
4/22/2024	66,700
4/23/2024	60,500
4/24/2024	54,400
4/25/2024	49,700
4/26/2024	45,800
4/27/2024	42,400
4/28/2024	39,600

Appendix A. Flow Data USGS Marietta Gage

Date	Average Daily Flow (cfs) (USGS Marietta Gage)
4/29/2024	37,300
4/30/2024	35,400
5/1/2024	32,700
5/2/2024	30,100
5/3/2024	28,500
5/4/2024	28,200
5/5/2024	29,400
5/6/2024	29,700
5/7/2024	28,500
5/8/2024	28,900
5/9/2024	29,500
5/10/2024	31,500
5/11/2024	43,400
5/12/2024	56,300
5/13/2024	67,600
5/14/2024	70,400
5/15/2024	69,200
5/16/2024	74,500
5/17/2024	69,500
5/18/2024	60,000
5/19/2024	53,300
5/20/2024	49,500
5/21/2024	46,100
5/22/2024	39,900

APPENDIX B. WATER QUALITY DATA

Appendix B. Water Quality Data

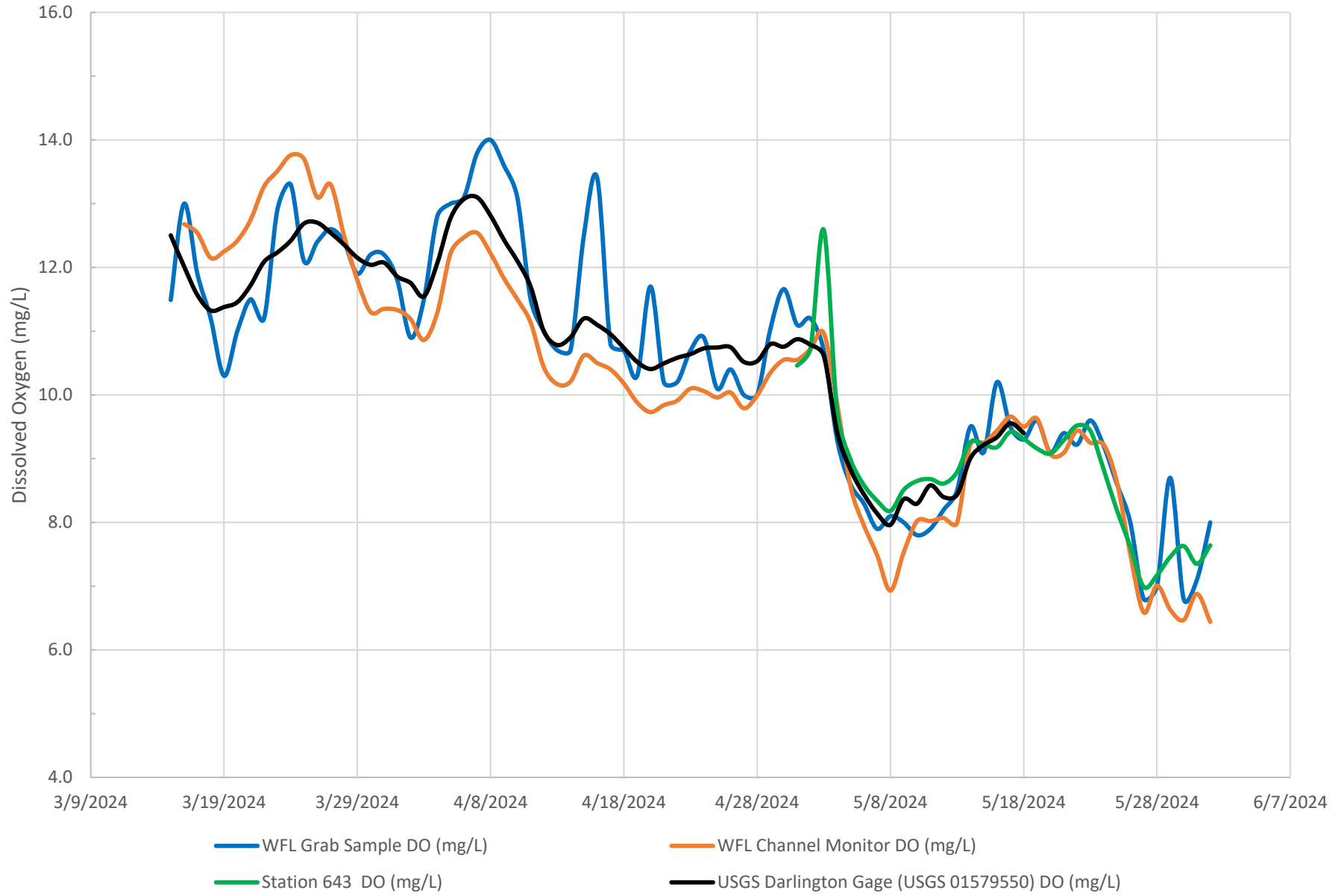
2024 Conowingo WFL/Susquehanna River Dissolved Oxygen Data

Date	WFL Grab Sample DO (mg/L)	WFL Channel Monitor DO (mg/L)	Station 643 DO (mg/L)	USGS Darlington Gage (USGS 01579550) DO (mg/L)
All Data from the 1100 Hour				
3/15/2024	11.5			12.5
3/16/2024	13.0	12.7		12.0
3/17/2024	11.9	12.5		11.6
3/18/2024	11.2	12.2		11.3
3/19/2024	10.3	12.3		11.4
3/20/2024	11.0	12.4		11.5
3/21/2024	11.5	12.8		11.7
3/22/2024	11.2	13.3		12.1
3/23/2024	12.9	13.5		12.2
3/24/2024	13.3	13.8		12.4
3/25/2024	12.1	13.7		12.7
3/26/2024	12.4	13.1		12.7
3/27/2024	12.6	13.3		12.5
3/28/2024	12.4	12.5		12.4
3/29/2024	11.9	11.8		12.2
3/30/2024	12.2	11.3		12.0
3/31/2024	12.2	11.4		12.1
4/1/2024	11.8	11.3		11.9
4/2/2024	10.9	11.2		11.8
4/3/2024	11.5	10.9		11.5
4/4/2024	12.8	11.3		12.1
4/5/2024	13.0	12.2		12.8
4/6/2024	13.1	12.5		13.1
4/7/2024	13.8	12.5		13.1
4/8/2024	14.0	12.2		12.8
4/9/2024	13.6	11.8		12.4
4/10/2024	13.1	11.5		12.1
4/11/2024	11.5	11.1		11.7
4/12/2024	11.0	10.4		11.0
4/13/2024	10.7	10.2		10.8
4/14/2024	10.7	10.2		10.9
4/15/2024	12.5	10.6		11.2
4/16/2024	13.4	10.5		11.1
4/17/2024	10.8	10.4		11.0
4/18/2024	10.7	10.2		10.7
4/19/2024	10.3	9.9		10.5
4/20/2024	11.7	9.7		10.4
4/21/2024	10.2	9.8		10.5
4/22/2024	10.2	9.9		10.6
4/23/2024	10.7	10.1		10.6
4/24/2024	10.9	10.1		10.7

Appendix B. Water Quality Data

Date	WFL Grab Sample DO (mg/L)	WFL Channel Monitor DO (mg/L)	Station 643 DO (mg/L)	USGS Darlington Gage (USGS 01579550) DO (mg/L)
4/25/2024	10.1	10.0		10.7
4/26/2024	10.4	10.0		10.7
4/27/2024	10.0	9.8		10.5
4/28/2024	10.0	10.0		10.5
4/29/2024	11.0	10.4		10.8
4/30/2024	11.7	10.6		10.8
5/1/2024	11.1	10.6	10.5	10.9
5/2/2024	11.2	10.7	10.7	10.8
5/3/2024	10.7	11.0	12.6	10.6
5/4/2024	9.3	9.9	9.7	9.4
5/5/2024	8.6	8.6	9.0	8.8
5/6/2024	8.3	8.0	8.6	8.4
5/7/2024	7.9	7.5	8.3	8.1
5/8/2024	8.1	6.9	8.2	8.0
5/9/2024	8.0	7.5	8.5	8.4
5/10/2024	7.8	8.0	8.7	8.3
5/11/2024	7.9	8.0	8.7	8.6
5/12/2024	8.2	8.1	8.6	8.4
5/13/2024	8.5	8.0	8.8	8.4
5/14/2024	9.5	9.2	9.3	9.0
5/15/2024	9.1	9.3	9.2	9.2
5/16/2024	10.2	9.4	9.2	9.3
5/17/2024	9.5	9.7	9.4	9.6
5/18/2024	9.3	9.5	9.3	9.4
5/19/2024	9.6	9.6	9.2	
5/20/2024	9.1	9.1	9.1	
5/21/2024	9.4	9.1	9.3	
5/22/2024	9.2	9.4	9.5	
5/23/2024	9.6	9.3	9.4	
5/24/2024	9.2	9.2	8.8	
5/25/2024	8.6	8.6	8.2	
5/26/2024	8.0	7.5	7.6	
5/27/2024	6.8	6.6	7.0	
5/28/2024	7.0	7.0	7.2	
5/29/2024	8.7	6.6	7.5	
5/30/2024	6.8	6.5	7.6	
5/31/2024	7.1	6.9	7.4	
6/1/2024	8.0	6.4	7.6	7.6

2024 Conowingo WFL/Susquehanna River Dissolved Oxygen Data



Appendix B. Water Quality Data

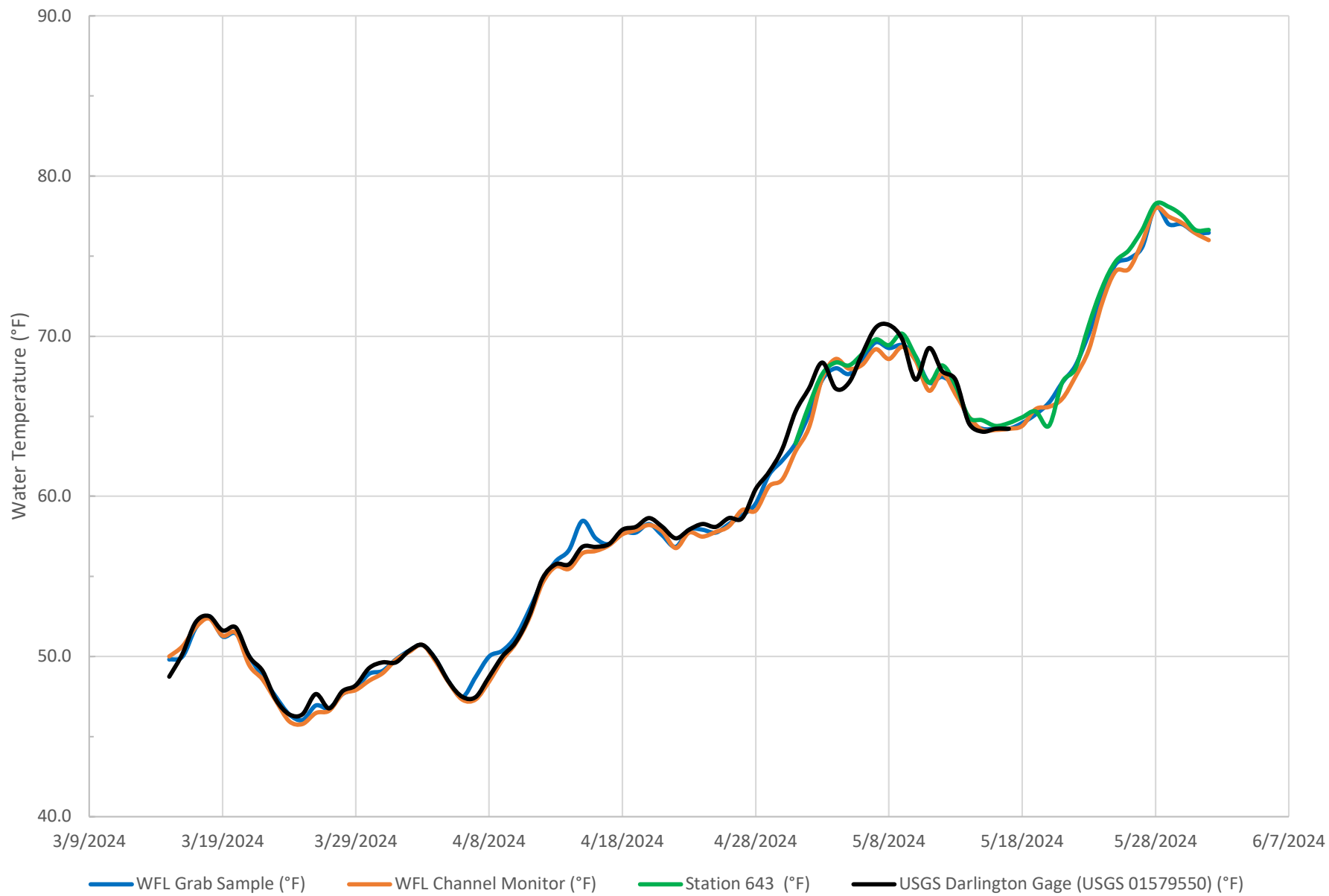
2024 Conowingo WFL/Susquehanna River Water Temperature Data

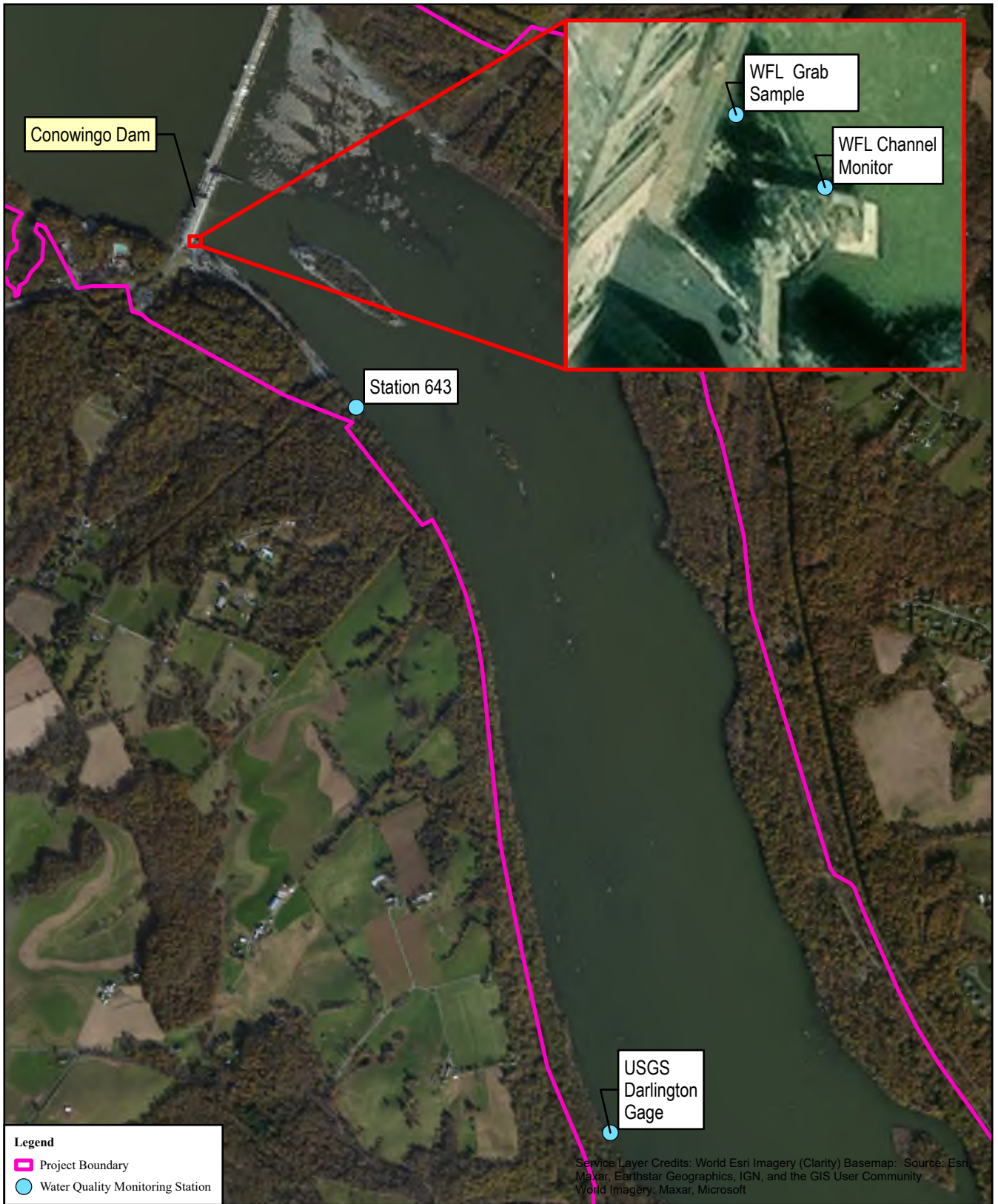
Date	WFL Grab Sample (°F)	WFL Channel Monitor (°F)	Station 643 (°F)	USGS Darlington Gage (USGS 01579550) (°F)
All Data from the 1100 Hour				
3/15/2024	49.8	50.0		48.7
3/16/2024	50.0	50.6		50.2
3/17/2024	51.8	51.8		52.2
3/18/2024	52.5	52.4		52.5
3/19/2024	51.3	51.3		51.6
3/20/2024	51.4	51.5		51.8
3/21/2024	50.0	49.5		50.0
3/22/2024	48.7	48.6		49.1
3/23/2024	47.5	47.2		47.3
3/24/2024	46.4	46.0		46.4
3/25/2024	46.0	45.8		46.4
3/26/2024	46.9	46.5		47.7
3/27/2024	46.8	46.6		46.8
3/28/2024	47.7	47.7		47.8
3/29/2024	48.0	47.9		48.2
3/30/2024	48.9	48.5		49.3
3/31/2024	49.1	49.0		49.6
4/1/2024	49.8	49.8		49.6
4/2/2024	50.4	50.3		50.4
4/3/2024	50.7	50.7		50.7
4/4/2024	49.8	49.7		49.8
4/5/2024	48.4	48.3		48.4
4/6/2024	47.5	47.3		47.5
4/7/2024	48.7	47.3		47.5
4/8/2024	50.0	48.5		48.7
4/9/2024	50.4	49.8		50.0
4/10/2024	51.3	50.8		50.9
4/11/2024	52.9	52.4		52.5
4/12/2024	54.7	54.6		54.9
4/13/2024	55.9	55.6		55.8
4/14/2024	56.7	55.5		55.8
4/15/2024	58.5	56.4		56.8
4/16/2024	57.4	56.6		56.8
4/17/2024	57.0	56.9		57.0
4/18/2024	57.7	57.6		57.9
4/19/2024	57.7	57.9		58.1
4/20/2024	58.3	58.2		58.6
4/21/2024	57.6	57.8		58.1
4/22/2024	56.8	56.8		57.4
4/23/2024	57.9	57.7		57.9
4/24/2024	57.9	57.5		58.3
4/25/2024	57.7	57.8		58.1

Appendix B. Water Quality Data

Date	WFL Grab Sample (°F)	WFL Channel Monitor (°F)	Station 643 (°F)	USGS Darlington Gage (USGS 01579550) (°F)
4/26/2024	58.3	58.1		58.6
4/27/2024	58.8	59.1		58.6
4/28/2024	59.5	59.1		60.4
4/29/2024	61.3	60.6		61.5
4/30/2024	62.2	61.1		63.0
5/1/2024	63.3	62.8	63.3	65.3
5/2/2024	65.1	64.3	65.7	66.7
5/3/2024	67.3	67.4	67.6	68.4
5/4/2024	68.0	68.6	68.4	66.7
5/5/2024	67.6	68.0	68.2	67.1
5/6/2024	68.5	68.2	68.9	68.9
5/7/2024	69.6	69.2	69.8	70.5
5/8/2024	69.3	68.6	69.4	70.7
5/9/2024	69.4	69.3	70.2	69.8
5/10/2024	68.7	68.5	68.7	67.3
5/11/2024	67.1	66.6	67.1	69.3
5/12/2024	67.5	67.7	68.2	67.8
5/13/2024	66.7	66.4	66.9	67.3
5/14/2024	64.8	65.0	64.9	64.6
5/15/2024	64.2	64.1	64.8	64.0
5/16/2024	64.2	64.1	64.4	64.2
5/17/2024	64.2	64.2	64.6	64.2
5/18/2024	64.6	64.4	64.9	
5/19/2024	65.1	65.4	65.3	
5/20/2024	65.8	65.6	64.4	
5/21/2024	67.1	66.1	67.1	
5/22/2024	68.2	67.5	68.0	
5/23/2024	70.2	69.2	70.7	
5/24/2024	72.5	72.1	73.0	
5/25/2024	74.5	74.0	74.7	
5/26/2024	74.8	74.2	75.4	
5/27/2024	75.6	75.9	76.6	
5/28/2024	78.1	78.0	78.3	
5/29/2024	77.0	77.5	78.1	
5/30/2024	77.0	77.1	77.5	
5/31/2024	76.5	76.4	76.6	
6/1/2024	76.5	76.0	76.6	78.4


2024 Conowingo WFL/Susquehanna River Water Temperature Data




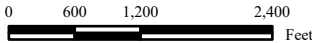


CONSTELLATION ENERGY GENERATION, LLC
CONOWINGO HYDROELECTRIC PROJECT
PROJECT NO. 405

Appendix B: Water Quality Monitoring Locations







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APPENDIX E. CONOWINGO WEST AND EAST FISH LIFTS OPERATION DATA AND FISH COUNTS

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Conowingo WFL			
Date	Start Time (First Lift)	End Time (Last Lift)	Operation Time (hours)
3/16/2024	12:00	18:40	6:40
3/17/2024	6:00	18:30	12:30
3/18/2024	6:00	18:30	12:30
3/19/2024	12:00	18:35	6:35
3/20/2024	8:30	18:35	10:05
3/21/2024	14:00	18:35	4:35
3/22/2024	11:38	18:33	6:55
3/23/2024	6:00	18:37	12:37
3/24/2024	11:30	18:35	7:05
3/25/2024	9:30	18:32	9:02
3/26/2024	8:30	18:20	9:50
3/27/2024	6:00	18:35	12:35
3/28/2024	7:00	18:29	11:29
3/29/2024	8:00	18:30	10:30
3/30/2024	8:30	18:20	9:50
3/31/2024	6:00	18:35	12:35
4/1/2024	6:30	15:21	8:51
4/2/2024			
4/3/2024			
4/4/2024			
4/5/2024			
4/6/2024			
4/7/2024			
4/8/2024			
4/9/2024			
4/10/2024			
4/11/2024			
4/12/2024			
4/13/2024			
4/14/2024			
4/15/2024			
4/16/2024			
4/17/2024			
4/18/2024	6:00	19:07	13:07
4/19/2024	5:30	19:05	13:35
4/20/2024	6:00	19:10	13:10
4/21/2024	5:30	19:05	13:35
4/22/2024	5:30	19:08	13:38
4/23/2024	5:30	18:55	13:25
4/24/2024	6:00	19:05	13:05
4/25/2024	5:30	19:05	13:35
4/26/2024	6:00	19:04	13:04
4/27/2024	5:30	19:05	13:35
4/28/2024	5:30	19:05	13:35

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Date	Start Time (First Lift)	End Time (Last Lift)	Operation Time (hours)
4/29/2024	5:30	19:08	13:38
4/30/2024	5:30	19:15	13:45
5/1/2024	5:00	19:30	14:30
5/2/2024	5:15	19:42	14:27
5/3/2024	5:00	19:33	14:33
5/4/2024	5:00	19:25	14:25
5/5/2024	5:00	19:35	14:35
5/6/2024	5:00	19:30	14:30
5/7/2024	5:00	19:30	14:30
5/8/2024	5:00	19:30	14:30
5/9/2024	6:00	19:17	13:17
5/10/2024	5:00	19:26	14:26
5/11/2024	5:00	19:25	14:25
5/12/2024	5:00	19:30	14:30
5/13/2024	5:00	19:20	14:20
5/14/2024	5:00	19:30	14:30
5/15/2024	5:00	19:30	14:30
5/16/2024	5:00	19:25	14:25
5/17/2024	5:00	19:28	14:28
5/18/2024	5:00	19:25	14:25
5/19/2024	5:00	19:30	14:30
5/20/2024	5:00	19:20	14:20
5/21/2024	5:00	19:25	14:25
5/22/2024	6:00	19:32	13:32
5/23/2024	5:00	19:30	14:30

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 WFL Hopper Fullness Data

Lift Number	3/16/24	3/17/24	3/18/24	3/19/24	3/20/24	3/21/24	3/22/24	3/23/24	3/24/24	3/25/24	3/26/24	3/27/24	3/28/24	3/29/24	3/30/24	3/31/24	4/1/24
1	50	25	10	25	10	10	10	10	-	10	10	10	10	10	10	10	10
2	50	100	10	10	25	10	10	10	10	-	50	10	25	10	100	100	10
3	100	50	10	25	10	10	10	10	10	-	10	10	50	10	10	25	10
4	100	50	10	10	10	10	10	10	10	-	25	10	100	10	10	50	10
5	75	50	10	25	10	10	10	10	10	-	25	-	10	10	10	25	10
6	100	50	10	10	25	10	10	10	10	10	10	10	10	10	10	50	10
7	100	50	10	10	10	10	10	10	10	-	25	10	10	10	10	100SO	10
8	100	75	10	10	10	10	10	10	10	10	25	10	10	10	10	100	10
9	50	50	10	10	10		10	10	10	10	10	-	10	10	10	10	10
10	50	25	10	10	10		10	10	10	10	-	-	10	10	10	10	10
11	50	25	10	10	10		-	10	10	10	10	-	10	10	10	10	10
12		25	10		10		10	10	10	10	10	10	10	10	10	10	10
13		50	10		10			10		10	10	10	10	10	10	10	10
14		50	25		10			10		10	10	-	10	10	10	10	10
15		75	25		10			10		10	10	10	10	10	10	10	10
16		75	25					10			10	-	10	10	10	10	
17		75	10					10			10	10	10	25	10	10	
18		75	10					10				10	10	25		10	
19		50						10				10	-			10	
20		50						10				10	10			10	
21													-				
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30																	
Daily Average Hopper Fullness (%)	75.0	53.8	12.5	14.1	12.0	10.0	9.2	10.0	9.2	6.7	15.3	7.0	16.0	11.7	15.3	25.3	10.0

Lift Percentage	3/16/24	3/17/24	3/18/24	3/19/24	3/20/24	3/21/24	3/22/24	3/23/24	3/24/24	3/25/24	3/26/24	3/27/24	3/28/24	3/29/24	3/30/24	3/31/24	4/1/24
0	-	-	-	-	-	-	1	-	1	5	1	6	2	-	-	-	-
10	-	-	15	8	13	8	11	20	11	10	11	14	16	16	16	13	15
25	-	4	3	3	2	-	-	-	-	-	4	-	1	2	-	2	-
50	5	10	-	-	-	-	-	-	-	-	1	-	1	-	-	2	-
75	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	5	1	-	-	-	-	-	-	-	-	-	-	1	-	1	2	-
Slight Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Moderate Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extreme Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Daily Lifts	11	20	18	11	15	8	12	20	12	15	17	20	21	18	17	20	15

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 WFL Hopper Fullness Data

Lift Number	4/2/24	4/3/24	4/4/24	4/5/24	4/6/24	4/7/24	4/8/24	4/9/24	4/10/24	4/11/24	4/12/24	4/13/24	4/14/24	4/15/24	4/16/24	4/17/24	4/18/24	4/19/24	
1																	50	10	
2																	10	100	
3																	25	75	
4																	100	100	
5																	100SO	100SO	
6																	25	75	
7																	50	50	
8																	100	50	
9																	10	75	
10																	100	100	
11																	75	50	
12																	100	50	
13																	25	100	
14																	50	50	
15																	50	75	
16																	75	100	
17																	75	100	
18																	100SO	50	
19																	100	100	
20																	75	50	
21																	50	75	
22																	75	100	
23																	50	100	
24																	50	50	
25																	50	75	
26																	25		
27																	25		
28																	10		
29																			
30																			
Daily Average Hopper Fullness (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	55.0	73.3

Lift Percentage	4/2/24	4/3/24	4/4/24	4/5/24	4/6/24	4/7/24	4/8/24	4/9/24	4/10/24	4/11/24	4/12/24	4/13/24	4/14/24	4/15/24	4/16/24	4/17/24	4/18/24	4/19/24
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	8
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	9
Slight Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1
Moderate Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extreme Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Daily Lifts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	25

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 WFL Hopper Fullness Data

Lift Number	4/20/24	4/21/24	4/22/24	4/23/24	4/24/24	4/25/24	4/26/24	4/27/24	4/28/24	4/29/24	4/30/24	5/1/24	5/2/24	5/3/24	5/4/24	5/5/24	5/6/24	5/7/24
1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2	25	100SO	75	25	10	10	10	50	10	50	50	25	100EO	100	100SO	100	100MO	75
3	25	75	10	10	10	10	10	10	25	10	25	25	100EO	10	10	75	25	25
4	50	50	25	10	10	10	10	10	10	10	75	100	25	25	25	75	75	25
5	50	50	50	10	10	10	10	10	25	25	25	100	50	25	25	75	10	25
6	100	50	10	10	25	10	10	10	10	25	25	100	50	25	10	50	25	10
7	25	50	10	10	10	10	10	10	10	10	25	100	75	25	10	75	25	25
8	50	50	25	10	10	10	10	25	10	25	10	100	75	25	10	75	10	10
9	50	75	75	10	10	10	-	10	10	25	25	75	75	10	25	50	25	10
10	100SO	75	75	10	10	10	10	10	10	25	50	75	75	25	10	75	25	10
11	100	100	100MO	10	25	10	10	25	10	25	50	50	25	10	10	50	25	10
12	75	100	100	10	10	10	10	25	10	25	100	50	25	25	10	10	10	10
13	75	100	75	10	10	10	10	25	25	50	75	75	25	50	10	10	10	10
14	100	75	50	-	10	10	10	10	25	50	100SO	100	25	50	10	10	10	25
15	75	100	100SO	25	10	10	10	10	25	75	25	75	25	10	10	10	10	25
16	100SO	75	100	10	10	10	25	10	10	50	100SO	75	25	10	10	10	10	50
17	25	50	100EO	10	25	10	25	10	10	10	50	50	25	10	10	10	10	10
18	25	50	100SO	10	25	10	25	10	10	10	100	50	50	10	10	10	10	10
19	10	50	100SO	10		10	25	10	10	10	100	25	75	10	10	10	25	25
20	50	25	25	10		10	10	10	10	10	25	25	100	10	10	10	10	10
21	10	25	10	10		10	10	10	10	10	10	50	25	10	10	10	25	10
22	10		10			10	10	10		10	10		25	10		10	10	10
23	10		10			10	10			10			10	10		10	10	
24	10		10				10						10	10		10	10	
25			10										10	10			10	
26			10										10					
27			10										10					
28													10					
29																		
30																		
Daily Average Hopper Fullness (%)	43.6	61.8	35.7	11.0	13.3	10.0	12.1	14.5	13.6	24.3	43.3	63.6	36.3	21.0	12.3	35.0	17.7	19.5

Lift Percentage	4/20/24	4/21/24	4/22/24	4/23/24	4/24/24	4/25/24	4/26/24	4/27/24	4/28/24	4/29/24	4/30/24	5/1/24	5/2/24	5/3/24	5/4/24	5/5/24	5/6/24	5/7/24
0	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
10	6	1	11	18	14	23	19	17	16	11	4	1	7	15	17	14	15	13
25	5	2	3	2	4	-	4	4	5	7	7	4	10	7	3	-	8	7
50	5	8	2	-	-	-	-	1	-	4	4	5	3	2	-	3	-	1
75	3	5	4	-	-	-	-	-	-	1	2	5	5	-	-	6	1	1
100	3	4	2	-	-	-	-	-	-	-	3	6	1	1	-	1	-	-
Slight Overcrowded	2	1	3	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-
Moderate Overcrowded	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Extreme Overcrowded	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Number of Daily Lifts	24	21	27	21	18	23	24	22	21	23	22	21	28	25	21	24	25	22

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 WFL Hopper Fullness Data

Lift Number	5/8/24	5/9/24	5/10/24	5/11/24	5/12/24	5/13/24	5/14/24	5/15/24	5/16/24	5/17/24	5/18/24	5/19/24	5/20/24	5/21/24	5/22/24	5/23/24	5/24/24
1	10	10	10	10	10	10	10	10	10	25	25	10	10	10	10	10	10
2	100	50	25	25	50	100	10	10	10	25	25	10	25	100	100	100SO	100SO
3	10	25	10	10	10	25	100SO	25	10	25	25	10	10	10	100SO	100	25
4	10	10	10	10	10	10	25	75	10	25	10	10	10	10	100	75	10
5	10	25	10	25	10	10	25	25	10	25	10	10	10	10	25	25	10
6	10	10	10	10	10	10	25	10	10	50	10	10	10	10	10	25	50
7	25	10	25	10	10	10	25	10	100	25	10	10	10	10	50	25	10
8	25	10	10	10	10	10	25	10	10	50	25	10	25	25	10	25	10
9	10	10	10	10	10	10	25	10	50	50	10	10	10	10	10	50	25
10	10	10	25	10	100	10	25	10	50	50	10	10	10	10	25	10	10
11	10	10	10	25	10	10	25	10	75	50	10	10	50	10	25	10	10
12	10	10	10	10	75	10	25	10	50	50	10	10	25	10	25	10	10
13	10	10	10	25	10	50	10	10	50	25	10	10	10	10	10	10	10
14	100	10	10	50	10	10	50	10	50	25	10	25	100	25	50	10	10
15	10	10	10	10	10	25	25	10	100	25	10	10	10	75	75	10	10
16	100	10	10	10	10	10	25	10	25	50	10	10	25	10	50	10	50
17	10	10	10	10	10	50	10	10	25	25	10	50	100SO	100	75	10	10
18	100	10	10	10	50	100	10	10	25	10	10	25	75	10	10	10	50
19	25	10	10	10	10	50	10	10	25	25	10	25	10	50	10	10	10
20	10	10	10	10	100SO	50	10	10	25	10	10	10	50	50	10	10	10
21	25	10	10	10	100	25	10	10		10	10	10	10	25	10	10	10
22	10	10	10	10	100	25	10	10		10	10	100EO	50	50	25	10	10
23		10	10		100		10	10		10	10	100	25	10	25	10	10
24			10				10	10		10			10		10		10
25													10		10		10
26															10		
27																	
28																	
29																	
30																	
Daily Average Hopper Fullness (%)	29.1	13.0	11.9	14.5	33.0	28.2	18.9	14.0	36.0	28.5	12.6	18.0	24.6	27.8	30.8	21.6	16.3

Lift Percentage	5/8/24	5/9/24	5/10/24	5/11/24	5/12/24	5/13/24	5/14/24	5/15/24	5/16/24	5/17/24	5/18/24	5/19/24	5/20/24	5/21/24	5/22/24	5/23/24	5/24/24
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	14	20	21	17	15	12	11	21	7	6	19	17	14	14	12	15	19
25	4	2	3	4	-	4	11	2	5	11	4	3	5	3	6	4	2
50	-	1	-	1	2	4	1	-	5	7	-	1	3	3	3	1	3
75	-	-	-	-	1	-	-	1	1	-	-	-	1	1	2	1	-
100	4	-	-	-	4	2	-	-	2	-	-	1	1	2	2	1	-
Slight Overcrowded	-	-	-	-	1	-	1	-	-	-	-	-	1	-	1	1	1
Moderate Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extreme Overcrowded	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Number of Daily Lifts	22	23	24	22	23	22	24	24	20	24	23	23	25	23	26	23	25

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 WFL Hopper Fullness Data

Lift Number	5/25/24	5/26/24	5/27/24	5/28/24	5/29/24	5/30/24	5/31/24	6/1/24
1	10	10	10	10	10	25	25	10
2	25	100	75	75	25	25	25	10
3	25	25	10	25	10	25	10	10
4	10	10	10	25	10	25	10	10
5	10	10	10	10	10	25	10	10
6	25	10	25	10	25	10	10	10
7	10	10	10	10	25	10	10	10
8	10	10	10	50	10	10	10	10
9	10	10	10	10	10	10	10	10
10	10	10	10	10	25	10	10	10
11	10	10	10	10	10	10	10	10
12	10	10	10	10	10	10	10	10
13	10	10	10	10	10	10	10	10
14	10	10	10	10	10	10	10	10
15	10	10	10	50	10	10	10	10
16	10	10	10	50	10	10	10	10
17	10	25	25	25	10	10	10	10
18	25	10	10	50	10	10	10	10
19	25	25	10	50	10	10	10	25
20	25	10	25	50	10	10	10	10
21	25	10	25	10	10	10	10	10
22	10	10	25	50	10	10	10	10
23	10	10	10	10		10	10	
24	10		25			10	10	
25								
26								
27								
28								
29								
30								
Daily Average Hopper Fullness (%)	14.4	15.9	16.5	27.0	12.7	13.1	11.3	10.7

Lift Percentage	5/25/24	5/26/24	5/27/24	5/28/24	5/29/24	5/30/24	5/31/24	6/1/24
0	-	-	-	-	-	-	-	-
10	17	19	17	12	18	19	22	21
25	7	3	6	3	4	5	2	1
50	-	-	-	7	-	-	-	-
75	-	-	1	1	-	-	-	-
100	-	1	-	-	-	-	-	-
Slight Overcrowded	-	-	-	-	-	-	-	-
Moderate Overcrowded	-	-	-	-	-	-	-	-
Extreme Overcrowded	-	-	-	-	-	-	-	-
Number of Daily Lifts	24	23	24	23	22	24	24	22

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Overall Avg. Fullness (%)	23.4
Overall Daily Avg. Fullness (%)	23.1

Fullness Percentage	#	% of Total
0	18	1.4%
10	822	62.4%
25	212	16.1%
50	115	8.7%
75	60	4.6%
100	65	4.9%
Slight Overcrowded	19	1.4%
Moderate Overcrowded	2	0.2%
Extreme Overcrowded	4	0.3%
Total Number of Lifts	1,317	100.0%

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Catch of fishes at the Conowingo Dam West Fish Lift, 2024		
Number of Days	62	
Number of Lifts	1,317	
Fishing Time (hours : minutes)	799:23	
Number of Taxa	40	% of Total
AMERICAN SHAD	1,016	0.41%
BLUEBACK HERRING	22	0.01%
ALEWIFE	21	0.01%
BLUE CATFISH	36	0.01%
FLATHEAD CATFISH	750	0.30%
NORTHERN SNAKEHEAD	1,965	0.79%
GIZZARD SHAD	231,212	93.24%
HICKORY SHAD	1	0.00%
STRIPED BASS	42	0.02%
CHANNEL CATFISH	5,582	2.25%
SHORTHEAD REDHORSE	3,224	1.30%
WALLEYE	532	0.21%
SMALLMOUTH BASS	1,026	0.41%
CARP	591	0.24%
WHITE PERCH	73	0.03%
AMERICAN EEL	108	0.04%
HYBRID STRIPED BASS	2	0.00%
ROCK BASS	30	0.01%
REDBREAST SUNFISH	3	0.00%
GREEN SUNFISH	2	0.00%
PUMPKINSEED	3	0.00%
BLUEGILL	119	0.05%
LARGEMOUTH BASS	77	0.03%
WHITE CRAPPIE	2	0.00%
BLACK CRAPPIE	37	0.01%
QUILLBACK	47	0.02%
WHITE SUCKER	3	0.00%
RAINBOW TROUT	11	0.00%
BROWN TROUT	10	0.00%
Tiger Trout (Brook x Brown Trout)	1	0.00%
SPLAKE (Brook x Lake Trout)	7	0.00%
MUSKELLUNGE	2	0.00%
TIGER MUSKIE	4	0.00%
COMELY SHINER	1,361	0.55%
SPOTTAIL SHINER	24	0.01%
SPOTFIN SHINER	2	0.00%
WHITE CATFISH	1	0.00%
BROWN BULLHEAD	3	0.00%
TESSELLATED DARTER	9	0.00%
YELLOW PERCH	6	0.00%
GREENSIDE DARTER	4	0.00%
SHIELD DARTER	1	0.00%

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

American Shad sex ratio information, Conowingo Dam West Fish Lift, 2024.
No operation on April 2 - 17, 2024

Date	Sample size	Males	Females	Male:Female Ratio
3/16/2024	0	0	0	N/A
3/17/2024	0	0	0	N/A
3/18/2024	0	0	0	N/A
3/19/2024	0	0	0	N/A
3/20/2024	0	0	0	N/A
3/21/2024	0	0	0	N/A
3/22/2024	0	0	0	N/A
3/23/2024	0	0	0	N/A
3/24/2024	0	0	0	N/A
3/25/2024	0	0	0	N/A
3/26/2024	0	0	0	N/A
3/27/2024	0	0	0	N/A
3/28/2024	0	0	0	N/A
3/29/2024	0	0	0	N/A
3/30/2024	0	0	0	N/A
3/31/2024	0	0	0	N/A
4/1/2024	0	0	0	N/A
4/2/2024	DID NOT OPERATE			
4/3/2024	DID NOT OPERATE			
4/4/2024	DID NOT OPERATE			
4/5/2024	DID NOT OPERATE			
4/6/2024	DID NOT OPERATE			
4/7/2024	DID NOT OPERATE			
4/8/2024	DID NOT OPERATE			
4/9/2024	DID NOT OPERATE			
4/10/2024	DID NOT OPERATE			
4/11/2024	DID NOT OPERATE			
4/12/2024	DID NOT OPERATE			
4/13/2024	DID NOT OPERATE			
4/14/2024	DID NOT OPERATE			
4/15/2024	DID NOT OPERATE			
4/16/2024	DID NOT OPERATE			
4/17/2024	DID NOT OPERATE			
4/18/2024	0	0	0	N/A
4/19/2024	0	0	0	N/A
4/20/2024	0	0	0	N/A
4/21/2024	0	0	0	N/A
4/22/2024	0	0	0	N/A
4/23/2024	2	1	1	1: 1.00
4/24/2024	1	1	0	1: 0.00
4/25/2024	0	0	0	N/A
4/26/2024	2	0	2	N/A
4/27/2024	0	0	0	N/A
4/28/2024	6	1	5	1: 5.00

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Date	Sample size	Males	Females	Male:Female Ratio
4/29/2024	3	0	3	N/A
4/30/2024	3	2	1	1: 0.50
5/1/2024	8	6	2	1: 0.33
5/2/2024	6	2	4	1: 2.00
5/3/2024	3	2	1	1: 0.50
5/4/2024	2	0	2	N/A
5/5/2024	5	3	2	1: 0.67
5/6/2024	8	2	6	1: 3.00
5/7/2024	19	11	8	1: 0.73
5/8/2024	107	46	56	1: 1.22
5/9/2024	69	33	36	1: 1.09
5/10/2024	41	12	29	1: 2.42
5/11/2024	40	18	22	1: 1.22
5/12/2024	44	14	30	1: 2.14
5/13/2024	7	5	2	1: 0.40
5/14/2024	2	0	2	N/A
5/15/2024	1	0	1	N/A
5/16/2024	7	1	6	1: 6.00
5/17/2024	1	1	0	1: 0.00
5/18/2024	8	6	2	1: 0.33
5/19/2024	15	4	11	1: 2.75
5/20/2024	25	9	16	1: 1.78
5/21/2024	26	14	12	1: 0.86

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Catch and effort of American Shad collected at the Conowingo Dam West Fish Lift during primary collection periods,* 1985-2024

Year	Number Days	Number Lifts	Fishing Hours	Total Catch	Catch Per Day	Catch Per Lift	Catch Per Hour
1985	37	839	328.6	1,518	41	2	4.6
1986	53	737	431.5	5,136	97	7	11.9
1987	49	1,295	506.5	7,659	156	6	15.1
1988	54	1,166	471.7	5,137	95	4	10.9
1989	46	1,034	447.2	8,216	179	8	18.4
1990	62	1,247	541	15,958	257	13	29.5
1991	59	1,123	478.5	13,273	225	12	27.7
1992	61	1,517	566	10,323	169	7	18.2
1993	41	971	398	5,328	130	5	13.4
1994	44	918	414	5,595	127	6	13.5
1995	64	1,216	632.2	15,588	244	13	24.7
1996	27	441	245.2	11,458	424	26	46.7
1997	44	611	295.1	12,974	295	21	44.0
1998	26	476	238.6	6,577	253	14	27.6
1999	43	709	312.6	9,658	225	14	30.9
2000	34	424	206.5	9,785	288	23	47.4
2001	41	425	195.1	10,940	267	26	56.1
2002	31	417	147.1	9,347	302	22	63.5
2003	31	637	171.8	9,802	316	27	57.0
2004	14	151	74.3	3,426	245	23	46.1
2005	30	295	165.9	3,896	130	13	23.5
2006	37	394	214.9	3,970	107	10	18.5
2007	29	288	135.3	4,272	147	15	31.6
2008	34	481	174.4	2,627	77	5	15.1
2009	28	282	144.1	6,534	233	23	45.3
2010	27	238	138.2	5,605	208	24	40.6
2011	15	144	85.6	3,074	205	21	35.9
2012	37	404	244	1,486	40	4	6.1
2013	24	288	134.1	2,030	85	7	15.1
2014	27	321	173.1	513	19	2	3.0
2015	19	194	100.5	875	46	4	8.7
2016	11	131	58.2	861	78	7	14.8
2017	13	123	56.4	736	56	6	13.0
2018	15	200	84.7	465	31	2	5.5
2019	20	227	124.3	390	19	2	3.1
2020	DID NOT OPERATE DUE TO COVID-19 PANDEMIC						
2021	59	1,378	552.5	6,825	115	5	12.3
2022	70	1,397	812.1	2,314	33	2	2.8
2023	65	1,388	759.0	4,390	67	3	5.8
2024	62	1,317	799.4	1,016	16	1.0	1.3

*Only applies to 1985-1995 data. Excludes early and late season catch and effort when less than 10 shad/day were taken.

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Operations and fish catch at Conowingo Dam West Fish Lift, 1985 - 2024

Year	Number of Days	Total Fish (Millions)	Number of Taxa	American Shad	Hickory Shad	Alewife	Blueback Herring
1985	55	2.318	41	1,546	9	377	6,763
1986	59	1.831	43	5,195	45	2,822	6,327
1987	60	2.593	43	7,667	35	357	5,861
1988	60	1.602	49	5,169	64	712	14,570
1989	53	1.066	45	8,311	28	1,902	3,611
1990	72	1.188	44	15,964	77	425	9,658
1991	63	0.533	45	13,330	120	2,649	15,616
1992	64	1.560	46	10,335	376	3,344	27,533
1993	45	0.713	37	5,343	0	572	4,052
1994	47	0.564	46	5,615	1	70	2,603
1995	68	0.995	44	15,588	36	5,405	93,859
1996	28	1.233	39	11,473	0	1	871
1997	44	0.346	39	12,974	118	11	133,257
1998	41	0.575	38	6,577	6	31	5,511
1999	43	0.722	34	9,658	32	1,795	8,546
2000	34	0.458	37	9,785	1	9,189	14,326
2001	41	0.310	38	10,940	36	7,824	16,320
2002	31	0.419	35	9,347	0	141	428
2003	31	0.147	30	9,802	1	16	183
2004	14	0.039	30	3,426	0	0	1
2005	30	0.094	36	3,896	0	0	0
2006	37	0.163	38	3,970	0	2	6
2007	29	0.159	36	4,272	0	7	153
2008	34	0.733	37	2,627	0	2	7
2009	28	0.226	39	6,534	4	20	165
2010	27	0.158	36	5,605	1	1	81
2011	15	0.100	32	3,074	0	0	0
2012	37	0.322	38	1,486	0	0	7
2013	24	0.489	33	2,030	0	0	2
2014	27	0.597	33	513	0	13	233
2015	19	0.242	29	875	0	29	17
2016	11	0.179	25	861	0	20	14
2017	13	0.177	29	736	0	5	0
2018	15	0.315	29	465	3	6	21
2019	20	0.228	31	390	1	0	13
2020	DID NOT OPERATE DUE TO COVID-19 PANDEMIC						
2021	59	1.476	39	6,825	7	14	13
2022	70	0.489	36	2,314	0	778	183
2023	65	0.399	37	4,390	1	17	3

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

**American Shad and Gizzard Shad ratio information,
Conowingo Dam West Fish Lift, 2024.**

No operation on April 2 - 17, 2024

Date	AMS	GS	AMS:GS Ratio
3/16/2024	0	7,400	N/A
3/17/2024	0	8,955	N/A
3/18/2024	0	1,052	N/A
3/19/2024	0	875	N/A
3/20/2024	0	1,166	N/A
3/21/2024	0	400	N/A
3/22/2024	0	347	N/A
3/23/2024	0	268	N/A
3/24/2024	0	262	N/A
3/25/2024	0	252	N/A
3/26/2024	0	1,522	N/A
3/27/2024	0	174	N/A
3/28/2024	0	1,663	N/A
3/29/2024	0	750	N/A
3/30/2024	0	1,425	N/A
3/31/2024	0	4,047	N/A
4/1/2024	0	201	N/A
4/2/2024	DID NOT OPERATE		
4/3/2024	DID NOT OPERATE		
4/4/2024	DID NOT OPERATE		
4/5/2024	DID NOT OPERATE		
4/6/2024	DID NOT OPERATE		
4/7/2024	DID NOT OPERATE		
4/8/2024	DID NOT OPERATE		
4/9/2024	DID NOT OPERATE		
4/10/2024	DID NOT OPERATE		
4/11/2024	DID NOT OPERATE		
4/12/2024	DID NOT OPERATE		
4/13/2024	DID NOT OPERATE		
4/14/2024	DID NOT OPERATE		
4/15/2024	DID NOT OPERATE		
4/16/2024	DID NOT OPERATE		
4/17/2024	DID NOT OPERATE		
4/18/2024	0	14,250	N/A
4/19/2024	0	16,900	N/A
4/20/2024	0	10,277	N/A
4/21/2024	0	11,654	N/A
4/22/2024	0	12,298	N/A
4/23/2024	2	1,056	1: 528
4/24/2024	1	1,287	1: 1,287
4/25/2024	0	402	N/A
4/26/2024	2	850	1: 425
4/27/2024	0	1,571	N/A

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Date	AMS	GS	AMS:GS Ratio	
4/28/2024	6	1,625	1:	271
4/29/2024	3	3,807	1:	1,269
4/30/2024	3	8,880	1:	2,960
5/1/2024	8	11,346	1:	1,418
5/2/2024	6	10,070	1:	1,678
5/3/2024	3	3,430	1:	1,143
5/4/2024	2	1,869	1:	935
5/5/2024	5	6,314	1:	1,263
5/6/2024	8	4,029	1:	504
5/7/2024	19	2,566	1:	135
5/8/2024	107	4,778	1:	45
5/9/2024	69	756	1:	11
5/10/2024	41	809	1:	20
5/11/2024	40	1,458	1:	36
5/12/2024	44	6,975	1:	159
5/13/2024	7	4,555	1:	651
5/14/2024	2	3,244	1:	1,622
5/15/2024	1	1,369	1:	1,369
5/16/2024	7	5,299	1:	757
5/17/2024	1	4,200	1:	4,200
5/18/2024	8	1,066	1:	133
5/19/2024	15	4,284	1:	286
5/20/2024	25	5,525	1:	221
5/21/2024	26	4,561	1:	175
5/22/2024	84	6,765	1:	81
5/23/2024	167	4,520	1:	27
5/24/2024	34	3,154	1:	93

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Conowingo EFL

Date	Start Time (First Lift)	End Time (Last Lift)	Operation Time (hours)
3/15/2024	8:00	13:58	5:58
3/16/2024	7:25	18:30	11:05
3/17/2024	6:00	18:30	12:30
3/18/2024	6:00	18:35	12:35
3/19/2024	11:30	18:30	7:00
3/20/2024	08:30	18:30	10:00
3/21/2024	13:30	18:30	5:00
3/22/2024	11:30	18:30	7:00
3/23/2024	6:20	18:30	12:10
3/24/2024	11:00	18:30	7:30
3/25/2024	9:30	18:30	9:00
3/26/2024	9:00	18:30	9:30
3/27/2024	6:20	18:40	12:20
3/28/2024			
3/29/2024	13:30	18:30	5:00
3/30/2024	8:20	18:30	10:10
3/31/2024	6:00	18:40	12:40
4/1/2024	6:00	19:00	13:00
4/2/2024	5:30	19:05	13:35
4/3/2024	05:40	15:30	9:50
4/4/2024			
4/5/2024			
4/6/2024			
4/7/2024			
4/8/2024			
4/9/2024			
4/10/2024	8:30	17:45	9:15
4/11/2024	5:30	19:00	13:30
4/12/2024	5:30	15:30	10:00
4/13/2024			
4/14/2024			
4/15/2024			
4/16/2024			
4/17/2024			
4/18/2024			
4/19/2024			
4/20/2024			
4/21/2024			
4/22/2024			
4/23/2024			
4/24/2024			
4/25/2024	8:36	19:00	10:24
4/26/2024	7:02	19:00	11:58
4/27/2024	5:55	19:10	13:15

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Date	Start Time (First Lift)	End Time (Last Lift)	Operation Time (hours)
4/28/2024	5:30	19:05	13:35
4/29/2024	9:28	18:58	9:30
4/30/2024	5:30	19:10	13:40
5/1/2024	5:30	19:35	14:05
5/2/2024	6:06	19:30	13:24
5/3/2024	5:30	19:30	14:00
5/4/2024	5:35	19:30	13:55
5/5/2024	5:00	19:15	14:15
5/6/2024	6:20	19:30	13:10
5/7/2024	5:30	19:21	13:51
5/8/2024	6:50	18:15	11:25
5/9/2024	6:44	19:30	12:46
5/10/2024	5:30	19:25	13:55
5/11/2024	5:44	19:24	13:40
5/12/2024	5:30	19:20	13:50
5/13/2024	5:51	19:25	13:34
5/14/2024	5:20	19:30	14:10
5/15/2024	6:03	19:20	13:17
5/16/2024	5:30	19:30	14:00
5/17/2024	5:39	16:14	10:35

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Overall Avg. Fullness (%)	36.0
Overall Daily Avg. Fullness (%)	34.3

Fullness Percentage	#	% of Total
0	44	4.9%
10	387	43.1%
25	105	11.7%
50	133	14.8%
75	149	16.6%
100	80	8.9%
Slight Overcrowded		
Moderate Overcrowded		
Extreme Overcrowded		
Total Number of Lifts	898	100.0%

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 EFL Hopper Fullness Data

Lift Number	4/2/24	4/3/24	4/4/24	4/5/24	4/6/24	4/7/24	4/8/24	4/9/24	4/10/24	4/11/24	4/12/24	4/13/24	4/14/24	4/15/24	4/16/24	4/17/24	4/18/24	4/19/24
1	10	10							10	10	10							
2	10	10							10	10	10							
3	10	10							10	10	10							
4	-	10							10	10	10							
5	10	10							10	10	10							
6	10	10							10	10	10							
7	10	10							10	10	10							
8	10	10							10	10	10							
9	10	10							10	10	10							
10	10	-							10	10	10							
11	10	-							10	10	10							
12	10	-							10	10	10							
13	10	10							10	10	10							
14	10	10							10	10	10							
15	10	10							10	10	10							
16	10	10							10	10	10							
17	10	10							10	10	10							
18	10	10							10	10	10							
19	10								10	10								
20	10									10								
21	10									10								
22	10									10								
23										10								
24										10								
25										10								
26																		
27																		
28																		
29																		
30																		
Daily Average Hopper Fullness (%)	9.5	8.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	10.0	10.0	10.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Lift Percentage	4/2/24	4/3/24	4/4/24	4/5/24	4/6/24	4/7/24	4/8/24	4/9/24	4/10/24	4/11/24	4/12/24	4/13/24	4/14/24	4/15/24	4/16/24	4/17/24	4/18/24	4/19/24
0	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	21	15	-	-	-	-	-	-	19	25	18	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slight Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2
Moderate Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extreme Overcrowded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Daily Lifts	22	18	0	0	0	0	0	0	19	25	18	0	0	0	0	2	1	2

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 EFL Hopper Fullness Data

Lift Number	4/20/24	4/21/24	4/22/24	4/23/24	4/24/24	4/25/24	4/26/24	4/27/24	4/28/24	4/29/24	4/30/24	5/1/24	5/2/24	5/3/24	5/4/24	5/5/24	5/6/24	5/7/24
1						75	25	50	50	75	100	25	75	50	10	75	25	25
2						50	50	25	25	50	50	75	50	50	75	75	100	25
3						75	75	50	25	75	75	100	25	50	25	50	75	75
4						50	75	75	50	75	100	75	50	25	50	50	75	75
5						10	75	75	50	50	100	100	75	50	50	50	50	75
6						50	50	75	75	25	75	100	75	50	25	50	75	75
7						50	50	75	50	50	75	100	50	75	25	25	100	75
8						10	25	75	50	50	100	100	25	75	25	50	100	75
9						10	25	75	50	75	100	100	25	75	75	50	100	75
10						10	10	25	50	75	25	100	100	50	75	25	100	75
11						10	25	25	75	75	25	100	100	50	25	50	75	75
12						10	25	25	25	50	25	75	50	100	25	50	50	50
13						10	10	75	50	50	25	75	50	75	75	75	100	75
14						10	10	25	50	50	50	25	75	50	75	100	75	75
15						10	25	25	75		50	75	50	50	75	50	100	75
16						10	25	25	50		100	50	50	75	75	75	100	75
17							25	25	50		75	50	10	75	75	75	100	75
18							25		50		75	50	25	75	75	75	100	75
19							10		25		50	50	10	50	75	50	100	100
20							10		10		50	75	25	50	50	50	75	100
21											50	75	25	25	50	50	100	100
22											25	75	10	10	25	25	100	50
23												75	10	25	25	25	100	
24													10				100	
25																		
26																		
27																		
28																		
29																		
30																		
Daily Average Hopper Fullness (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	28.1	32.5	48.5	46.8	58.9	63.6	75.0	43.8	54.8	50.4	54.3	86.5	71.6

Lift Percentage	4/20/24	4/21/24	4/22/24	4/23/24	4/24/24	4/25/24	4/26/24	4/27/24	4/28/24	4/29/24	4/30/24	5/1/24	5/2/24	5/3/24	5/4/24	5/5/24	5/6/24	5/7/24
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	10	5	-	1	-	-	-	5	1	1	-	-	-
25	-	-	-	-	-	-	9	8	4	1	5	2	6	3	8	4	1	2
50	-	-	-	-	-	4	3	2	12	7	6	4	7	11	4	12	2	2
75	-	-	-	-	-	2	3	7	3	6	5	9	4	7	10	6	6	15
100	-	-	-	-	-	-	-	-	-	-	6	8	2	1	-	1	15	3
Slight Overcrowded	1	3	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-
Moderate Overcrowded	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Extreme Overcrowded	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Number of Daily Lifts	1	5	0	0	0	16	20	17	20	16	22	25	24	24	23	24	24	22

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

2024 EFL Hopper Fullness Data

Lift Number	5/8/24	5/9/24	5/10/24	5/11/24	5/12/24	5/13/24	5/14/24	5/15/24	5/16/24	5/17/24
1	50	10	100	10	50	25	50	75	100	100
2	100	10	100	25	75	100	75	25	100	75
3	50	50	25	25	75	100	75	25	25	75
4	100	75	75	25	25	100	75	50	75	100
5	75	75	100	50	75	100	75	75	75	100
6	50	50	50	100	50	100	25	75	75	100
7	50	75	100	75	50	75	75	100	50	75
8	50	25	25	25	75	100	75	75	25	75
9	75	25	50	25	75	100	50	75	75	75
10	25	50	25	75	75	75	50	75	50	75
11	50	50	50	100	75	100	75	100	50	75
12	25	50	50	100	75	100	75	100	75	75
13	25	50	75	100	75	100	75	75	75	100
14	25	50	100	75	50	100	75	50	50	100
15	75	50	100	50		100	75	25	50	100
16	50	50	100	75		100	50	25	50	50
17	10	75	100	50		100	25	50	75	100
18	50	50	75	75		75	50	25	50	100
19	75	50	50	50		100	75	25	25	
20	50	50	50	75		100	50		25	
21	25	50	25	75		75	25		25	
22		50	50	75		50	10		25	
23		50	25			25	25		25	
24			25			25	25		10	
25									10	
26										
27										
28										
29										
30										
Daily Average Hopper Fullness (%)	51.7	48.7	63.5	60.7	64.3	84.4	55.6	59.2	50.8	86.1

Lift Percentage	5/8/24	5/9/24	5/10/24	5/11/24	5/12/24	5/13/24	5/14/24	5/15/24	5/16/24	5/17/24
0	-	-	-	-	-	-	-	-	-	-
10	1	2	-	1	-	-	1	-	2	-
25	5	2	6	5	1	3	5	6	7	-
50	9	15	7	4	4	1	6	3	7	1
75	4	4	3	8	9	4	12	7	7	8
100	2	-	8	4	-	16	-	3	2	9
Slight Overcrowded	-	-	-	1	-	1	-	-	-	-
Moderate Overcrowded	-	-	-	-	-	-	-	-	-	-
Extreme Overcrowded	-	-	-	-	-	-	-	-	-	-
Number of Daily Lifts	21	23	24	23	14	25	24	19	25	18

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Overall Avg. Fullness (%)	36.0
Overall Daily Avg. Fullness (%)	34.3

Fullness Percentage	#	% of Total
0	44	4.9%
10	387	43.1%
25	105	11.7%
50	133	14.8%
75	149	16.6%
100	80	8.9%
Slight Overcrowded		
Moderate Overcrowded		
Extreme Overcrowded		
Total Number of Lifts	898	100.0%

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Catch of fishes at the Conowingo Dam East Fish Lift, 2024		
Number of Days	45	
Number of Lifts	898	
Fishing Time (hours : minutes)	518:52	
Number of Taxa	33	% of Total
AMERICAN SHAD	1,621	0.20%
BLUEBACK HERRING	35	0.00%
ALEWIFE	2	0.00%
NORTHERN SNAKEHEAD	119	0.01%
GIZZARD SHAD	821,030	99.31%
STRIPED BASS	24	0.00%
CHANNEL CATFISH	1,445	0.17%
SHORTHEAD REDHORSE	685	0.08%
WALLEYE	107	0.01%
SMALLMOUTH BASS	723	0.09%
CARP	413	0.05%
AMERICAN EEL	10	0.00%
HYBRID STRIPED BASS	1	0.00%
ROCK BASS	1	0.00%
GREEN SUNFISH	3	0.00%
PUMPKINSEED	1	0.00%
BLUEGILL	24	0.00%
LARGEMOUTH BASS	9	0.00%
WHITE CRAPPIE	1	0.00%
BLACK CRAPPIE	3	0.00%
QUILLBACK	481	0.06%
WHITE SUCKER	2	0.00%
NORTHERN HOGSUCKER	1	0.00%
RAINBOW TROUT	1	0.00%
BROWN TROUT	1	0.00%
SPLAKE (Brook x Lake Trout)	1	0.00%
MUSKELLUNGE	2	0.00%
COMELY SHINER	2	0.00%
SPOTFIN SHINER	1	0.00%
BROWN BULLHEAD	1	0.00%
TESSELLATED DARTER	3	0.00%
YELLOW PERCH	4	0.00%
SEA LAMPREY	10	0.00%
TOTAL	826,767	

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

American Shad sex ratio information, Conowingo Dam East Fish Lift, 2023.

No operation on March 28, April 4-9, 13-24, May 18-June 1, 2024

Date	Sample size	Males	Females	Male:Female Ratio
3/15/2024	0	0	0	N/A
3/16/2024	0	0	0	N/A
3/17/2024	0	0	0	N/A
3/18/2024	0	0	0	N/A
3/19/2024	0	0	0	N/A
3/20/2024	0	0	0	N/A
3/21/2024	0	0	0	N/A
3/22/2024	0	0	0	N/A
3/23/2024	0	0	0	N/A
3/24/2024	0	0	0	N/A
3/25/2024	0	0	0	N/A
3/26/2024	0	0	0	N/A
3/27/2024	0	0	0	N/A
3/28/2024	DID NOT OPERATE			
3/29/2024	0	0	0	N/A
3/30/2024	0	0	0	N/A
3/31/2024	0	0	0	N/A
4/1/2024	0	0	0	N/A
4/2/2024	0	0	0	N/A
4/3/2024	0	0	0	N/A
4/4/2024	DID NOT OPERATE			
4/5/2024	DID NOT OPERATE			
4/6/2024	DID NOT OPERATE			
4/7/2024	DID NOT OPERATE			
4/8/2024	DID NOT OPERATE			
4/9/2024	DID NOT OPERATE			
4/10/2024	0	0	0	N/A
4/11/2024	0	0	0	N/A
4/12/2024	0	0	0	N/A
4/13/2024	DID NOT OPERATE			
4/14/2024	DID NOT OPERATE			
4/15/2024	DID NOT OPERATE			
4/16/2024	DID NOT OPERATE			
4/17/2024	DID NOT OPERATE			
4/18/2024	DID NOT OPERATE			
4/19/2024	DID NOT OPERATE			
4/20/2024	DID NOT OPERATE			
4/21/2024	DID NOT OPERATE			
4/22/2024	DID NOT OPERATE			
4/23/2024	DID NOT OPERATE			
4/24/2024	DID NOT OPERATE			
4/25/2024	1	0	1	N/A
4/26/2024	1	0	1	N/A
4/27/2024	49	24	25	1:1.04

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Date	Sample size	Males	Females	Male:Female Ratio
4/28/2024	75	36	39	1: 1.08
4/29/2024	101	48	53	1: 1.10
4/30/2024	180	67	57	1: 0.85
5/1/2024	247	74	67	1: 0.91
5/2/2024	6	1	5	1: 5.00
5/3/2024	134	51	74	1: 1.45
5/4/2024	92	45	47	1: 1.04
5/5/2024	52	26	26	1: 1.00
5/6/2024	179	55	56	1: 1.02
5/7/2024	352	46	67	1: 1.46
5/8/2024	75	28	47	1: 1.68
5/9/2024	9	3	6	1: 2.00
5/10/2024	3	1	2	1: 2.00
5/11/2024	1	0	1	N/A
5/12/2024	3	1	2	1: 2.00
5/13/2024	2	0	2	N/A
5/14/2024	3	0	3	N/A
5/15/2024	32	15	17	1: 1.13
5/16/2024	18	7	11	1: 1.57
5/17/2024	6	4	2	1: 0.50

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Catch and effort of American Shad collected at the Conowingo Dam East Fish Lift during primary collection periods,* 1991-2024

Year	Number Days	Number Lifts	Fishing Hours	Total Catch	Catch Per Day	Catch Per Lift	Catch Per Hour
1991	60	1,168	647.2	13,897	232	12	21.5
1992	70	599	454.1	15,386	220	26	33.9
1993	42	848	463.5	8,203	195	10	17.7
1994	55	955	574.8	26,715	486	28	46.5
1995	68	986	706.2	46,062	677	47	65.2
1996	49	599	454.1	26,040	531	43	57.3
1997	64	652	640	90,971	1,421	140	142.1
1998	50	460	640	39,904	798	87	62.4
1999	52	610	467	69,712	1,341	114	149.3
2000	45	570	367.8	153,546	3,412	269	417.5
2001	43	559	359.8	193,574	4,502	346	538.0
2002	49	560	440.7	108,001	2,204	193	245.1
2003	44	645	416.6	125,135	2,844	194	300.4
2004	44	590	390.3	109,360	2,485	185	280.2
2005	52	541	434.3	68,926	1,326	127	158.7
2006	61	619	429.8	56,899	933	92	132.4
2007	39	479	335.3	25,464	653	53	75.9
2008	51	483	407	19,914	390	41	48.9
2009	57	618	495.6	29,272	514	47	59.1
2010	59	685	526.2	37,757	640	55	71.8
2011	15	259	142.4	20,571	1,371	79	144.5
2012	62	1,230	633.7	22,143	357	18	34.9
2013	60	925	575.6	12,733	212	14	22.1
2014	54	988	509	10,425	193	11	20.5
2015	46	674	433	8,341	181	12	19.3
2016	55	860	536	14,276	260	17	26.6
2017	46	849	463	16,265	354	19	35.1
2018	48	714	416	6,992	146	10	16.8
2019	46	788	415	4,787	104	6	11.5
2020*	4	64	34.6	485	121	8	14.0
2021	DID NOT OPERATE DUE TO INVASIVE SPECIES CONTROL						
2022	74	1,599	818.2	2,283	31	1	2.8
2023	66	1,590	790.5	5,632	85	4	7.1
2024	45	898	518.9	1,621	36	2	3.1

* Lift operation ceased after 4 days due to the COVID-19 pandemic

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Operations and fish catch at Conowingo Dam East Fish Lift, 1985 - 2024

Year	Number of Days	Total Fish (Millions)	Number of Taxa	American Shad	Hickory Shad	Alewife	Blueback Herring
1991	60	0.651	42	13,897	0	323	13,149
1992	70	2.395	35	15,386	20	285	7,347
1993	42	0.530	29	8,203	0	0	4,574
1994	55	1.063	36	26,715	1	5	248
1995	68	1.796	36	46,062	1	170	4,004
1996	49	0.492	35	26,040	0	3	261
1997	64	0.719	36	90,971	0	63	242,815
1998	50	0.713	33	39,904	0	6	700
1999	52	1.184	31	69,712	0	14	130,625
2000	45	0.494	30	153,546	0	2	14,963
2001	43	0.922	30	193,574	0	7,458	284,921
2002	49	0.657	31	108,001	6	74	2,037
2003	44	0.589	25	125,135	0	21	530
2004	44	0.716	30	109,360	0	89	101
2005	52	0.378	30	68,926	0	0	4
2006	61	0.715	32	56,899	4	0	0
2007	39	0.539	31	25,464	0	429	460
2008	51	0.944	29	19,914	0	4	1
2009	57	0.915	30	29,272	0	160	71
2010	59	0.857	38	37,757	0	1	4
2011	15	0.289	24	20,571	20	2	17
2012	62	1.110	35	22,143	0	27	25
2013	60	1.095	27	12,733	1	0	7
2014	54	1.193	34	10,425	2	111	25
2015	46	0.754	28	8,341	8	10	3
2016	55	0.865	27	14,276	0	0	34
2017	46	0.845	32	16,265	0	6	59
2018	48	1.041	25	6,992	0	58	2
2019	46	0.833	22	4,787	0	0	15
2020*	4	0.049	16	485	0	1	0
2021	DID NOT OPERATE DUE TO COVID-19 PANDEMIC						
2022	74	1.468	35	2,283	2	1	94
2023	66	1.464	38	5,632	3	1	391
2024	45	0.827	33	1,621	0	2	35

**American Shad and Gizzard Shad ratio information, Conowingo
Dam East Fish Lift, 2023.**

**No operation on March 28, April 4-9, 13-24, May 18-June 1,
2024**

Date	AMS	GS	AMS:GS Ratio	
3/15/2024	0	2	N/A	
3/16/2024	0	81	N/A	
3/17/2024	0	556	N/A	
3/18/2024	0	596	N/A	
3/19/2024	0	297	N/A	
3/20/2024	0	1,566	N/A	
3/21/2024	0	1,680	N/A	
3/22/2024	0	75	N/A	
3/23/2024	0	263	N/A	
3/24/2024	0	54	N/A	
3/25/2024	0	242	N/A	
3/26/2024	0	1,245	N/A	
3/27/2024	0	18	N/A	
3/28/2024	DID NOT OPERATE			
3/29/2024	0	355	N/A	
3/30/2024	0	1,411	N/A	
3/31/2024	0	3,979	N/A	
4/1/2024	0	106	N/A	
4/2/2024	0	154	N/A	
4/3/2024	0	24	N/A	
4/4/2024	DID NOT OPERATE			
4/5/2024	DID NOT OPERATE			
4/6/2024	DID NOT OPERATE			
4/7/2024	DID NOT OPERATE			
4/8/2024	DID NOT OPERATE			
4/9/2024	DID NOT OPERATE			
4/10/2024	0	622	N/A	
4/11/2024	0	2,007	N/A	
4/12/2024	0	1,765	N/A	
4/13/2024	DID NOT OPERATE			
4/14/2024	DID NOT OPERATE			
4/15/2024	DID NOT OPERATE			
4/16/2024	DID NOT OPERATE			
4/17/2024	DID NOT OPERATE			
4/18/2024	DID NOT OPERATE			
4/19/2024	DID NOT OPERATE			
4/20/2024	DID NOT OPERATE			
4/21/2024	DID NOT OPERATE			
4/22/2024	DID NOT OPERATE			
4/23/2024	DID NOT OPERATE			
4/24/2024	DID NOT OPERATE			
4/25/2024	1	12,930	1:	12,930

APPENDIX E. CONOWINGO WEST AND EAST FISH LIFT OPERATION DATA AND FISH COUNTS

Date	AMS	GS	AMS:GS Ratio	
4/26/2024	1	15,900	1:	15,900
4/27/2024	49	21,100	1:	431
4/28/2024	75	23,700	1:	316
4/29/2024	101	22,900	1:	227
4/30/2024	180	39,800	1:	221
5/1/2024	247	52,850	1:	214
5/2/2024	6	30,550	1:	5,092
5/3/2024	134	33,205	1:	248
5/4/2024	92	33,500	1:	364
5/5/2024	52	32,700	1:	629
5/6/2024	179	63,400	1:	354
5/7/2024	352	45,950	1:	131
5/8/2024	75	29,950	1:	399
5/9/2024	9	27,707	1:	3,079
5/10/2024	3	40,985	1:	13,662
5/11/2024	1	39,080	1:	39,080
5/12/2024	3	28,900	1:	9,633
5/13/2024	2	60,900	1:	30,450
5/14/2024	3	35,915	1:	11,972
5/15/2024	32	31,400	1:	981
5/16/2024	18	33,010	1:	1,834
5/17/2024	6	47,600	1:	7,933

APPENDIX F. CONOWINGO WEST AND EAST FISH LIFTS TRANSPORTS AND MORTALITIES

APPENDIX F. CONOWINGO WEST AND EAST FISH LIFT TRANSPORTS AND MORTALITIES

American Shad Transport Summary to Canal Lock Boat Ramp for the Conowingo Dam East and West Fish Lift, March 16 - June 1, 2024

Date	East Fish Lift Number Transported	West Fish Lift Number Transported	Number of Transport Mortalities	Number Stocked	Total Number of Fish Stocked for Season
4/28/2024	50	6	0	56	56
4/29/2024	75	4	0	79	135
4/30/2024	110	2	0	112	247
5/1/2024	144	5	0	149	396
5/2/2024	66	6	0	72	468
5/4/2024	197	0	0	197	665
5/6/2024	159	17	0	176	841
5/7/2024	171	3	0	174	1,015
5/8/2024	97	74	0	171	1,186
5/9/2024	15	91	0	106	1,292
5/11/2024	7	78	0	85	1,377
5/16/2024	33	7	0	40	1,417
5/18/2024	19	7	0	26	1,443
5/21/2024	0	57	0	57	1,500
5/23/2024	0	200	2	198	1,698
5/24/2024	0	79	0	79	1,777
5/26/2024	0	55	0	55	1,832
5/27/2024	0	77	0	77	1,909
TOTAL	1,143	768	2	1,909	

Appendix F-WFL and EFL Transport and Mortalities

**American Shad Transport Summary to Columbia Riverfront Park Boat Ramp for the
Conowingo Dam East and West Fish Lift, March 16 - June 1, 2024**

Date	East Fish Lift Number Transported	West Fish Lift Number Transported	Number of Transport Mortalities	Number Stocked	Total Number of Fish Stocked for Season
5/1/2024	185	5	0	192	190
5/7/2024	194	12	0	206	396
5/13/2024	0	55	0	55	451
TOTAL	379	72	0	451	

Appendix F-WFL and EFL Transport and Mortalities

**Alewife Transport Summary to Canal Lock Boat Ramp for the Conowingo Dam
East and West Fish Lift, March 16 - June 1, 2024**

Date	East Fish Lift Number Transported	West Fish Lift Number Transported	Number of Transport Mortalities	Number Stocked	Total Number of Fish Stocked for Season
4/28/2024	0	1	0	1	1
4/30/2024	0	1	0	1	2
5/1/2024	0	1	1	0	2
5/6/2024	2	0	0	2	4
5/21/2024	0	1	0	1	5
TOTAL	2	4	1	5	

Appendix F-WFL and EFL Transport and Mortalities

**Alewife Transport Summary to Columbia Riverfront Park Boat Ramp for the
Conowingo Dam East and West Fish Lift, March 16 - June 1, 2024**

Date	East Fish Lift Number Transported	West Fish Lift Number Transported	Number of Transport Mortalities	Number Stocked	Total Number of Fish Stocked for Season
5/1/2024	0	5	0	5	5
5/13/2024	0	3	0	3	8
TOTAL	0	8	0	8	

Appendix F-WFL and EFL Transport and Mortalities

Blueback Herring Transport Summary to Canal Lock Boat Ramp for the Conowingo Dam East and West Fish Lift, March 16 - June 1, 2024

Date	East Fish Lift Number Transported	West Fish Lift Number Transported	Number of Transport Mortalities	Number Stocked	Total Number of Fish Stocked for Season
5/8/2024	32	0	0	32	32
5/9/2024	2	4	0	3	35
5/11/2024	0	4	0	1	36
5/16/2024	0	2	0	2	38
5/18/2024	0	6	0	6	44
5/21/2024	0	2	0	2	46
5/23/2024	0	8	0	8	54
TOTAL	34	26	0	54	

Appendix F-WFL and EFL Transport and Mortalities

**Blueback Herring Transport Summary to Columbia Riverfront Park Boat Ramp for
the Conowingo Dam East and West Fish Lift, March 16 - June 1, 2024**

Date	East Fish Lift Number Transported	West Fish Lift Number Transported	Number of Transport Mortalities	Number Stocked	Total Number of Fish Stocked for Season
No BBH Transported to Columbia					
TOTAL	0	0	0	0	

Appendix F-WFL and EFL Transport and Mortalities

2024 WFL American Shad and River Herring Holding Mortality Sheet						2024 EFL American Shad and River Herring Holding Mortality Sheet					
Date	Number	Total Length (mm)	Weight (g)	Sex	Species	Date	Number	Total Length (mm)	Weight (g)	Sex	Species
5/9/2024	1	519	1,261	Female	American Shad						
	2	539	1,917	Female	American Shad						
	3	443	894	Male	American Shad						
5/13/2024	1	464	1,071	Female	American Shad						
5/23/2024	1	516	1,539	Female	American Shad						
	2	255	131	Female	Blueback Herring						
5/26/2024	1	483	1,006	Male	American Shad						

Appendix F-WFL and EFL Transport and Mortalities

2024 WFL American Shad and River Herring Transport Mortality Sheet						2024 EFL American Shad and River Herring Transport Mortality Sheet					
Date	Number	Total Length (mm)	Weight (g)	Sex	Species	Date	Number	Total Length (mm)	Weight (g)	Sex	Species
5/23/2024	1	496	1,170	Female	American Shad						
	2	505	1,271	Female	American Shad						

Appendix F-WFL and EFL Transport and Mortalities

2024 WFL American Shad and River Herring Lift Mortality Sheet						2024 EFL American Shad and River Herring Lift Mortality Sheet					
Date	Number	Total Length (mm)	Weight (g)	Sex	Species	Date	Number	Total Length (mm)	Weight (g)	Sex	Species
5/6/2024	1	484	1,212	Female	American Shad	5/1/2024	1	507	1,158	Female	American Shad
5/16/2024	1	509	1,192	Female	American Shad	5/7/2024	1	527	1,361	Female	American Shad
5/24/2024	1	460	942	Female	American Shad	5/7/2024	2	479	871	Female	American Shad
	2	400	509	Female	American Shad	5/7/2024	3	525	1,448	Female	American Shad
	3	535	1,235	Female	American Shad	5/7/2024	4	470	895	Male	American Shad
						5/7/2024	5	500	1,368	Female	American Shad
						5/7/2024	6	442	818	Male	American Shad

Appendix F-WFL and EFL Transport and Mortalities

2024 American Shad and River Herring Transfer Skid Mortality Sheet

Date	Number	Total Length (mm)	Weight (g)	Sex	Species
4/29/2024	1	467	883	Female	American Shad
4/30/2024	1	440	781	Male	American Shad
5/6/2024	1	502	1,136	Female	American Shad
	2	465	857	Male	American Shad
5/7/2024	1	529	1,285	Female	American Shad
5/8/2024	1	498	1,293	Female	American Shad
	2	516	1,285	Female	American Shad

**American Shad, Alewife, and Blueback Herring Transport and Stocking Summary to Canal Lock Boat Ramp and Columbia Riverfront
Park Boat Ramp for the Conowingo Dam Fish Lifts, March 15 - June 1, 2024**

Date	Transport Number	Stocking Location	American Shad Stocked	Alewife Stocked	Blueback Herring Stocked	Transport Mortalities	Min. Temperature (°F)	Max. Temperature (°F)	Min. Dissolved Oxygen (mg/L)	Max. Dissolved Oxygen (mg/L)
4/28/2024	1	Canal Lock	56	1	-	-	16.1	18.9	9.90	11.30
4/29/2024	2	Canal Lock	79	-	-	-	16.2	16.7	10.50	14.20
4/30/2024	3	Canal Lock	112	1	-	-	16.3	16.7	10.33	13.37
5/1/2024	4	Canal Lock	149	-	-	1 Alewife*	18.4	18.9	9.35	19.94
5/1/2024	5	Columbia	190	5	-	-	17.7	18.1	10.17	19.90
5/2/2024	6	Canal Lock	72	-	-	-	19.0	20.8	12.44	20.46
5/4/2024	7	Canal Lock	197	-	-	-	20.3	20.3	10.17	12.01
5/6/2024	8	Canal Lock	176	2	-	-	20.7	20.9	9.35	14.25
5/7/2024	9	Columbia	206	-	-	-	21.1	21.3	9.54	11.91
5/7/2024	10	Canal Lock	174	-	-	-	21.4	21.6	10.47	18.30
5/8/2024	11	Canal Lock	171	-	32	-	21.4	21.9	8.69	12.75
5/9/2024	12	Canal Lock	106	-	3	-	20.8	21.0	11.37	16.99
5/11/2024	13	Canal Lock	85	-	1	-	20	20	10.89	18.97
5/13/2024	14	Columbia	55	3	-	-	19.5	19.9	14.08	17.49
5/16/2024	15	Canal Lock	40	-	2	-	18.8	19.0	10.50	11.59
5/18/2024	16	Canal Lock	26	-	6	-	18.4	18.4	N/A	N/A
5/21/2024	17	Canal Lock	57	1	2	-	20.2	20.5	8.31	18.75
5/23/2024	18	Canal Lock	198	-	8	2 A. Shad	20.8	21.0	9.45	13.51
5/24/2024	19	Canal Lock	79	-	-	-	22.1	22.4	11.91	13.37
5/26/2024	20	Canal Lock	55	-	-	-	24.4	24.6	9.53	11.05
5/27/2024	21	Canal Lock	77	-	-	-	24.6	24.7	9.86	11.74
TOTALS			2,360	13	54	2 A. Shad				

* 1 Alewife mortality was observed but unable to be retrieved.

APPENDIX G. CONOWINGO WEST AND EAST FISH LIFTS BIOLOGICAL SAMPLING

Appendix G. Conowingo West and East Fish Lift Biological Sampling

2024 WFL American Shad Sacrifice Sheet					2024 EFL American Shad Sacrifice Sheet				
Date	Number	Total Length (mm)	Weight (g)	Sex	Date	Number	Total Length (mm)	Weight (g)	Sex
5/7/2024	1	460	822	Male	4/27/2024	1	460	895	Male
5/8/2024	1	445	685	Male	4/28/2024	1	520	1,331	Female
	2	420	742	Male	4/29/2024	1	461	845	Male
5/9/2024	1	496	1,321	Female		2	461	795	Male
5/10/2024	1	452	762	Male	4/30/2024	1	444	697	Male
5/11/2024	1	450	829	Male		2	480	1,160	Female
5/12/2024	1	490	1,146	Female		3	468	879	Male
5/19/2024	1	514	1,157	Female		4	419	686	Male
5/21/2024	1	495	902	Female	5/1/2024	1	481	844	Male
5/22/2024	1	457	802	Female		2	424	682	Male
5/23/2024	1	459	760	Male		3	481	953	Female
	2	466	857	Female		4	531	1,300	Female
	3	500	1,097	Male		5	480	1,060	Female
	4	449	689	Male	5/3/2024	1	465	992	Male
5/25/2024	1	473	803	Male		2	473	903	Female
5/26/2024	1	429	933	Female	5/4/2024	1	470	781	Male
5/27/2024	1	456	928	Male		2	346	359	Male
5/29/2024	1	492	1,152	Female	5/5/2024	1	500	1,019	Female
5/31/2024	1	529	1,174	Male	5/6/2024	1	493	1,158	Female
6/1/2024	1	472	756	Male		2	395	741	Male
						3	426	930	Male
					5/7/2024	1	397	598	Male
						2	492	949	Female
						3	472	1,127	Female
						4	520	1,422	Female
						5	491	1,328	Female
						6	502	1,207	Female
						7	422	675	Male
						8	360	385	Male
					5/8/2024	1	484	1,162	Female
					5/9/2024	1	523	1,419	Female
					5/16/2024	1	458	956	Female

Appendix G. Conowingo West and East Fish Lift Biological Sampling

2024 WFL Herring Sacrifice Sheet

2024 EFL Herring Sacrifice Sheet

Date	Number	Total Length (mm)	Weight (g)	Sex	Species	Date	Number	Total Length (mm)	Weight (g)	Sex	Species
5/13/2024	1	285	165	Female	Alewife	5/8/2024	1	260	138	Male	Blueback Herring
5/22/2024	1	277	142	Male	Blueback Herring						

APPENDIX H. CALIBRATION OF FLOWS, CONOWINGO WEST EEL COLLECTION FACILITY, 2024

Calibration of Flows (Gallons per Minute), Conowingo West Eel Collection Facility, 2024

	DATE									
	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun	3-Jul
Collection Tank Fill	10.0	15.0	17.0	17.5	9.0	9.5	13.0	9.9	14.5	8.5
Collection Tank Drain	13.5	15.5	16.5	17.5	12.0	10.0	14.0	11.2	15.0	9.0
Holding Tank #1 Drain	17.0		17.5							
Holding Tank #2 Drain	17.5	21.5	17.0	21.5	13.5					
Holding Tank #3 Drain	20.0	22.0	17.5	41.3	21.0	30.0	36.8	28.0	39.0	30.0
Spray Bar	6.3	7.5	7.4	7.5	6.8	7.5	9.0	7.8	4.4	7.5
Scent line	1.1	1.4	1.3	1.4	0.6	0.7	1.5	1.3	1.6	1.5
Backside of Ramp	4.6	1.9	0.8	1.4	3.6	1.2	2.5	2.6	2.1	2.0
Top Attraction	1.7	5.6	6.6	6.1	3.2	6.3	6.6	5.3	2.3	5.5
Bottom of Ramp Attraction	68.0	59.0	68.5	80.3	46.5	40.0	50.8	39.2	54.0	39.0
Total Attraction*	70.80	66.00	76.35	87.75	50.25	47.00	58.75	45.70	57.85	46.00

	DATE									
	10-Jul	17-Jul	24-Jul	31-Jul	6-Aug	14-Aug	21-Aug	28-Aug	11-Sep	18-Sep
Collection Tank Fill	11.0	14.5	13.8	11.0	12.0	9.0	15.5	15.6	12.5	10.0
Collection Tank Drain	12.0	18.8	18.0	11.5	12.0	7.5	15.0	20.3	12.0	15.0
Holding Tank #1 Drain										
Holding Tank #2 Drain										7.0
Holding Tank #3 Drain	30.0	37.5	19.5	34.5	41.3	33.8	49.5	59.0	30.0	35.0
Spray Bar	7.2	8.4	8.7	6.75	7.05	7.05	7.65	7.8	6	7.8
Scent line	1.1	1.65	2	1.5	1.7	1.75	2.1	1.8	1.8	1.3
Backside of Ramp	2.1	5.9	6.2	2	1.7	0.25	1.6	6.45	1.3	6.3
Top Attraction	5.1	2.5	2.5	4.8	5.4	6.8	6.1	1.4	4.7	1.5
Bottom of Ramp Attraction	42.0	56.3	37.5	46.0	53.3	41.3	64.5	79.3	42.0	57.0
Total Attraction*	48.20	60.40	42.00	52.25	60.30	49.80	72.65	82.40	48.50	59.80

	DATE									
	25-Sep	2-Oct	9-Oct	16-Oct	23-Oct	30-Oct	6-Nov	13-Nov	20-Nov	27-Nov
Collection Tank Fill	12.5	15.5	13.5	9.0	11.1	15.0	12.0	12.0	15.0	14.0
Collection Tank Drain	13.0	17.0	14.0	12.0	11.1	15.5	11.0	13.0	14.0	13.5
Holding Tank #1 Drain		5.7								
Holding Tank #2 Drain			18.5	12.0	8.4	15.0	16.0	9.0	16.0	34.5
Holding Tank #3 Drain	37.5	33.8	42.8	43.5	42.0	25.5	45.0	30.0	37.5	34.5
Spray Bar	6.5	6.8	6.8	6.9	7.8	6.9	7.1	12.5	6.9	6.8
Scent line	1.4	1.6	0.8	1.0	1.5	1.5	1.5	1.4	1.6	1.5
Backside of Ramp	0.9	3.1	1.3	4.0	1.5	2.0	0.5	2.4	0.6	1.0
Top Attraction	5.7	3.7	5.5	2.9	6.3	5.0	7.0	10.1	6.3	5.8
Bottom of Ramp Attraction	50.0	56.5	75.3	67.5	61.5	59.0	72.0	52.0	67.5	82.5
Total Attraction*	57.00	61.70	81.50	74.40	69.30	65.40	80.05	63.50	75.40	89.25

* Tank flows were reduced to get accurate flow measurement and to calibrate. All Flow returned to normal operating condition after calibration was complete at approximately 70 gpm total flow.

Water temperature (°F) from Conowingo West Eel Collection facility's Collection Tank, 2024*

Day	May	June	July	August	September	October	November	December
1	68.0	79.2	85.8	86.4	80.4	77.7	63.5	49.5
2	67.5	79.0	84.7	86.9	80.4	77.5	61.0	47.5
3	68.7	79.3	84.6	86.9	81.3	76.6	61.7	47.3
4	68.7	80.2	84.6	87.6	81.1	75.7	61.7	
5	70.5	79.2	84.7	87.4	81.1	75.7	64.8	
6	71.4	79.9	85.6	88.3	80.8	75.7	66.0	
7	72.3	81.1	85.3	88.3	80.8	75.4	65.8	
8	71.2	81.0	85.8	86.9	79.3	75.0	63.9	
9	72.7	81.0	86.2	84.9	78.6	74.5	60.3	
10	71.1	81.0	85.8	84.9	78.4	73.6	59.9	
11	71.1	79.9	86.5	79.0	78.8	72.3	65.3	
12	70.2	79.7	88.3	75.2	78.4	71.6	60.8	
13	70.2	79.9	87.8	74.3	79.0	71.4	59.5	
14	67.6	79.9	88.3	75.0	79.3	72.1	59.0	
15	66.9	80.6	87.8	75.6	79.7	70.9	60.1	
16	67.3	82.6	88.2	75.7	79.2	69.6	60.1	
17	67.3	81.9	88.9	75.9	80.2	68.4	58.8	
18	67.3	81.1	90.1	77.0	80.1	67.6	60.3	
19	67.8	82.8	90.0	78.4	80.4	66.6	59.5	
20	68.4	81.9	89.6	77.5	80.4	66.7	61.0	
21	68.7	83.1	89.1	76.8	80.2	66.9	58.3	
22	67.6	83.7	88.9	75.9	79.2	67.3	57.4	
23	72.7	85.1	88.5	76.3	79.5	67.6	58.5	
24	74.8	86.2	88.5	76.1	77.2	67.5	58.5	
25	75.9	86.9	88.0	76.5	75.9	67.8	57.9	
26	76.5	86.2	88.2	78.6	77.5	67.3	57.6	
27	79.2	86.0	88.3	79.5	77.9	66.6	57.6	
28	81.0	86.5	88.0	77.7	77.9	65.7	57.6	
29	81.0	86.7	87.3	85.1	77.5	65.1	56.7	
30	80.2	86.2	86.4	79.3	77.4	64.8	54.5	
31	79.0		86.5	79.5	32.0	64.8		

*Starting November 1st temperature was taken from the Darlington USGS gage at 11:00am

Dissolved Oxygen (mg/L) reading from Conowingo's Station 643, 2024*

Day	May	June	July	August	September	October	November	December
1	11.7	7.7	7.7	7.6	8.8	8.7	9.8	11.2
2	10.7	7.2	7.6	7.3	8.9	8.0	11.1	11.6
3	10.8	7.6	7.9	7.7	7.1	8.7	12.1	12.1
4	9.7	7.1	7.5	7.4	7.3	8.2	12.2	
5	9.0	7.1	7.3	7.1	8.0	8.8	12.0	
6	8.6	7.3	7.3	7.5	8.5	8.4	11.3	
7	8.3	7.4	7.3	7.4	8.4	9.1	11.0	
8	7.9	7.2	7.1	7.5	8.1	8.7	11.2	
9	8.3	6.8	6.9	7.6	7.6	9.2	11.8	
10	8.3	7.9	6.7	7.2	8.3	9.8	11.3	
11	8.5	8.5	6.6	8.3	7.9	11.1	11.1	
12	8.5	8.4	7.1	8.8	7.7	10.2	11.3	
13	8.4	7.9	7.4	8.7	7.9	10.7	11.9	
14	9.1	7.5	7.3	8.6	7.7	11.6	10.1	
15	9.2	8.3	6.7	8.5	7.6	10.0	11.6	
16	9.3	8.5	6.0	9.1	7.5	10.1	11.7	
17	9.5	8.3	6.1	8.9	8.6	11.3	12.3	
18	9.4	8.6	6.3	8.8	8.7	10.2	12.2	
19	9.1	8.0	6.6	8.2	8.8	10.6	12.0	
20	8.9	7.4	6.6	7.6	8.6	9.5	11.7	
21	9.2	7.5	6.6	7.2	8.7	10.2	11.8	
22	9.0	6.8	6.8	7.4	8.4	9.4	9.7	
23	9.4	6.7	7.2	8.2	7.7	10.4	10.1	
24	8.8	7.1	6.8	8.9	7.6	8.9	11.7	
25	7.9	7.5	7.4	8.8	7.7	11.1	10.7	
26	7.5	7.0	8.3	8.8	7.7	11.1	10.8	
27	6.8	7.3	8.3	8.3	8.2	11.0	10.5	
28	7.0	7.5	8.3	8.4	8.2	11.0	9.1	
29	7.3	7.9	7.6	8.9	7.8	11.2	10.1	
30	7.5	8.0	8.2	8.6	7.5	11.7	10.4	
31	7.2		7.6	8.9		11.3		

*Starting November 1st dissolved oxygen was taken from the Darlington USGS gage at 11:00am

APPENDIX I. 2024 CONOWINGO WEST EEL COLLECTION FACILITY

Number of eel collected at Conowingo West Eel Collection Facility, 2024

Date	Number of Eels	Date	Number of Eels	Date	Number of Eels	Date	Number of Eels	Date	Number of Eels
5/1/2024	-	6/14/2024	145	7/28/2024	645	9/10/2024	2,346	10/24/2024	15
5/2/2024	4	6/15/2024	197	7/29/2024	1,309	9/11/2024	3,545	10/25/2024	36
5/3/2024	44	6/16/2024	206	7/30/2024	1,944	9/12/2024	1,609	10/26/2024	12
5/4/2024	1,286	6/17/2024	213	7/31/2024	3,262	9/13/2024	1,463	10/27/2024	25
5/5/2024	1,209	6/18/2024	102	8/1/2024	1,556	9/14/2024	2,175	10/28/2024	7
5/6/2024	1,779	6/19/2024	241	8/2/2024	1,267	9/15/2024	1,090	10/29/2024	5
5/7/2024	2,525	6/20/2024	168	8/3/2024	1,476	9/16/2024	934	10/30/2024	2
5/8/2024	2,428	6/21/2024	288	8/4/2024	861	9/17/2024	313	10/31/2024	2
5/9/2024	1,969	6/22/2024	512	8/5/2024	1,065	9/18/2024	171	11/1/2024	4
5/10/2024	1,728	6/23/2024	573	8/6/2024	1,531	9/19/2024	141	11/2/2024	1
5/11/2024	1,327	6/24/2024	2,964	8/7/2024	1,007	9/20/2024	151	11/3/2024	5
5/12/2024	679	6/25/2024	2,002	8/8/2024	771	9/21/2024	162	11/4/2024	-
5/13/2024	703	6/26/2024	2,439	8/9/2024	752	9/22/2024	666	11/5/2024	2
5/14/2024	595	6/27/2024	1,380	8/10/2024	1,004	9/23/2024	204	11/6/2024	10
5/15/2024	35	6/28/2024	1,891	8/11/2024	572	9/24/2024	81	11/7/2024	7
5/16/2024	58	6/29/2024	1,292	8/12/2024	1,146	9/25/2024	86	11/8/2024	14
5/17/2024	192	6/30/2024	635	8/13/2024	1,369	9/26/2024	411	11/9/2024	6
5/18/2024	211	7/1/2024	901	8/14/2024	3,854	9/27/2024	239	11/10/2024	36
5/19/2024	315	7/2/2024	735	8/15/2024	5,611	9/28/2024	154	11/11/2024	36
5/20/2024	432	7/3/2024	434	8/16/2024	5,908	9/29/2024	227	11/12/2024	63
5/21/2024	383	7/4/2024	429	8/17/2024	17,852	9/30/2024	265	11/13/2024	22
5/22/2024	448	7/5/2024	151	8/18/2024	21,976	10/1/2024	159	11/14/2024	5
5/23/2024	539	7/6/2024	114	8/19/2024	34,076	10/2/2024	192	11/15/2024	12
5/24/2024	700	7/7/2024	549	8/20/2024	18,902	10/3/2024	66	11/16/2024	41
5/25/2024	1,846	7/8/2024	1,403	8/21/2024	16,748	10/4/2024	21	11/17/2024	22
5/26/2024	1,608	7/9/2024	804	8/22/2024	17,494	10/5/2024	30	11/18/2024	7
5/27/2024	2,818	7/10/2024	815	8/23/2024	7,900	10/6/2024	129	11/19/2024	12
5/28/2024	4,024	7/11/2024	374	8/24/2024	8,508	10/7/2024	38	11/20/2024	12
5/29/2024	5,719	7/12/2024	191	8/25/2024	6,342	10/8/2024	46	11/21/2024	6
5/30/2024	2,673	7/13/2024	1,241	8/26/2024	10,902	10/9/2024	33	11/22/2024	12
5/31/2024	1,632	7/14/2024	780	8/27/2024	6,287	10/10/2024	14	11/23/2024	2
6/1/2024	840	7/15/2024	589	8/28/2024	11,644	10/11/2024	10	11/24/2024	15
6/2/2024	954	7/16/2024	498	8/29/2024	5,044	10/12/2024	11	11/25/2024	53
6/3/2024	718	7/17/2024	312	8/30/2024	7,590	10/13/2024	3	11/26/2024	16
6/4/2024	557	7/18/2024	238	8/31/2024	6,216	10/14/2024	10	11/27/2024	46
6/5/2024	333	7/19/2024	32	9/1/2024	7,735	10/15/2024	14	11/28/2024	11
6/6/2024	193	7/20/2024	70	9/2/2024	8,255	10/16/2024	2	11/29/2024	11
6/7/2024	293	7/21/2024	28	9/3/2024	6,062	10/17/2024	6	11/30/2024	16
6/8/2024	113	7/22/2024	668	9/4/2024	6,710	10/18/2024	3	12/1/2024	2
6/9/2024	712	7/23/2024	62	9/5/2024	5,002	10/19/2024	3	12/2/2024	3
6/10/2024	151	7/24/2024	31	9/6/2024	4,338	10/20/2024	3	12/3/2024	-
6/11/2024	100	7/25/2024	71	9/7/2024	3,365	10/21/2024	5		
6/12/2024	74	7/26/2024	205	9/8/2024	2,856	10/22/2024	6	Total	371,655
6/13/2024	280	7/27/2024	7	9/9/2024	2,861	10/23/2024	22		

Bolded numbers are peak days

Number of eel held at Conowingo West Eel Collection Facility, 2024

Day	May	June	July	August	September	October	November	December
1	-	848	-	-	-	158	4	85
2	5	1,806	-	-	-	350	5	88
3	49	2,530	-	-	-	-	10	-
4	1,335	-	-	-	-	21	-	-
5	2,543	336	-	-	-	51	2	-
6	4,317	1,877	-	-	-	180	12	-
7	6,843	-	-	-	-	-	-	-
8	-	16,892	-	-	-	46	13	-
9	1,970	-	-	-	-	79	19	-
10	3,698	-	-	-	-	-	55	-
11	5,025	-	-	-	-	10	91	-
12	5,704	-	-	-	-	20	154	-
13	6,401	-	-	-	-	23	176	-
14	-	-	-	-	-	-	-	-
15	35	-	-	-	-	14	12	-
16	93	-	-	-	929	16	53	-
17	284	-	-	-	1,241	-	75	-
18	495	-	-	-	-	3	82	-
19	810	-	-	-	141	6	94	-
20	1,235	-	-	-	292	9	-	-
21	-	-	-	-	452	-	6	-
22	450	-	-	-	1,118	6	12	-
23	990	-	-	-	-	28	20	-
24	1,689	-	-	-	-	-	35	-
25	3,535	-	-	-	-	36	88	-
26	5,143	-	-	-	-	48	-	-
27	7,981	-	-	-	239	72	46	-
28	-	-	-	-	393	-	57	-
29	6	-	-	-	620	5	68	-
30	5,745	-	-	-	-	7	83	-
31			-	-		7	Total = 98,728	

Number of eels held were combined from CWECF and OCEF

* Collection tank was checked multiple times the evening before to keep from overcrowding, eels placed in holding tank for a few hours until transport the next morning.

**APPENDIX J. AGENCY COMMENTS AND RESPONSIVENESS SUMMARY ON 2024
DRAFT FOMP ANNUAL REPORT**

2024 Draft FOMP Annual Report– Resource Agency Comment Responsiveness Summary

Comment	Response
PADEP, January 6, 2025	
No comment.	
FWS, January 13, 2025	
<p>Sections 2.2.1.3.1 and 2.2.2.3.1:</p> <ul style="list-style-type: none"> Please include a figure that shows daily shad catch compared to the proportion of lifts in that day that had a hopper fullness level of 75% or more. 	<p>Figure 2.2.1.3.1-2 and Figure 2.2.2.3.1-2 have been included to present daily shad catch at the WFL and EFL compared to the proportion of lifts in that day that had a hopper fullness level of 75% or more.</p>
<p>Sections 2.2.1.3.1 and 2.2.2.3.1:</p> <ul style="list-style-type: none"> Please include a figure that shows daily shad catch with dissolved oxygen and water temperature, similar to the graph that was presented in the annual meeting FOMP presentation on slide 10 for the East Fish Lift. Include a similar figure for the West Fish Lift. 	<p>Figure 2.2.1.3.1-1 and Figure 2.2.2.3.1-1 have been included to graphically present the daily catch of American Shad at the WFL and EFL versus dissolved oxygen and water temperature recorded at the Project.</p>
<p>Appendix B:</p> <ul style="list-style-type: none"> Please include a plan-view figure to indicate the location of the four different sample locations. 	<p>A plan view figure indicating the location of the four different sampling locations has been added to Appendix B.</p>

Comment	Response
<p>For the 2025 Fish Passage Season:</p> <ul style="list-style-type: none"> Please take representative photos for each of the different categories of hopper fullness at the East Fish Lift. 	<p>Constellation will continue to make visual estimates and take photos of the predetermined classifications of hopper fullness during the 2025 fish migration season. This is additionally stated in Constellation’s January 23, 2025, FERC filing detailing the operation of the 2025 fish passage season.</p>
<p>For the 2025 Fish Passage Season:</p> <ul style="list-style-type: none"> For the shad and herring transports, please conduct two back-to-back stocking events upstream of Safe Harbor during the stocking rotation. If one out of 5 trucks is to go upstream of Safe Harbor, do the last truck of the first round of five trucks and then reverse the order in second set of five trucks to have the first truck go upstream of Safe Harbor and the remaining four upstream of York Haven. Continue that routine for the entire season, if possible. 	<p>Constellation is in agreement with the suggested transport scenario for the upcoming 2025 Trap & Transport season.</p>
<p>Maryland (MDE working with MDNR)</p>	
<p>No response received.</p>	

From: Eberts, Ron <reberts@pa.gov>

Sent: Monday, January 6, 2025 10:56 AM

To: Kendra Gorski <kgorski@gomezandsullivan.com>; Kirk Smith <ksmith@gomezandsullivan.com>; Danucalov, Andrea H:(Constellation Power) <u000ahd@constellation.com>; 'Mike.Cox@ERM.com'; David Frazier <dfrazier@gomezandsullivan.com>; Sheila Eyler <Sheila_Eyler@fws.gov>; Ian Kiraly <ikiraly@gomezandsullivan.com>; ahenning <ahenning@srbc.gov>; 'jesus_morales@fws.gov'; Miller, Jeremy <jeremmille@pa.gov>; 'Sadzinski, Robert' <bob.sadzinski@maryland.gov>; Martinek, Michael <mmartinek@normandeau.com>; 'Seaman, Shawn' <shawn.seaman@maryland.gov>; Smith, Fred P:(Constellation Power) <fredp.smith@constellation.com>; "Steffy, Luanne" <lsteffy@srbc.net>; Williamson, Scott <scwilliams@pa.gov>; 'Heather Nelson -MDE-' <hnelson@maryland.gov>; 'Tony Prochaska -DNR-' <tony.prochaska@maryland.gov>; 'Brett Coakley -DNR-' <brett.coakley@maryland.gov>; 'Donald Pugh' <don.pugh@outlook.com>; 'Matthew Jargowsky -DNR-' <matthew.jargowsky@maryland.gov>; 'emily.zollweg-horan@dec.ny.gov'; Kuhn, Kristopher <kkuhn@pa.gov>; danielle.spendiff1@maryland.gov; Matty Jr, Robert M:(Constellation Power - TSA) <robert.matty@constellation.com>; branson.williams@maryland.gov; Tom Sullivan <tsullivan@gomezandsullivan.com>; William Friers <wfriers@gomezandsullivan.com>; McHail, Brian <bmchail@pa.gov>; Bearden, Matthew G <matthew_bearden@fws.gov>; Victoria Westerman -MDE- <victoria.westerman@maryland.gov>

Subject: EXTERNAL EMAIL -RE: [External] 2024 FOMP Annual Report for review

CAUTION: This email originated from outside of GSE. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Andrea,

PADEP has reviewed the attached DRAFT 2024 Conowingo Fishway Operation and Maintenance Plan Annual Report received on 12/23/24. We do not have any comments or edits to the report.

Thank you for the opportunity to review and comment.

Ronald C. Eberts, Jr. | Environmental Protection Compliance Specialist
Department of Environmental Protection
Southcentral Regional Office
Waterways & Wetlands Program
909 Elmerton Avenue | Harrisburg, PA 17110
Phone: 717.705.4819 | Fax: 717.705.4760

THE SOUTHCENTRAL REGIONAL OFFICE AFTER HOURS REPORTING & 24 HOUR EMERGENCY RESPONSE NUMBER: 1-800-541-2050.

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pennsylvania

DEPARTMENT OF ENVIRONMENTAL
PROTECTION

From: Eyler, Sheila <sheila_eyler@fws.gov>

Sent: Monday, January 13, 2025 1:08 PM

To: Kendra Gorski <kgorski@gomezandsullivan.com>; Kirk Smith <ksmith@gomezandsullivan.com>; Danucalov, Andrea H: (Constellation Power) <Andrea.Danucalov@constellation.com>; 'Mike.Cox@ERM.com'; David Frazier <dfrazier@gomezandsullivan.com>; 'Eberts, Ron' <reberts@pa.gov>; Ian Kiraly <ikiraly@gomezandsullivan.com>; Henning, Aaron <ahenning@srbc.gov>; 'jesus_morales@fws.gov'; 'Miller, Jeremy' <jeremmille@pa.gov>; 'Sadzinski, Robert' <bob.sadzinski@maryland.gov>; Martinek, Michael <mmartinek@normandeau.com>; 'Seaman, Shawn' <shawn.seaman@maryland.gov>; Smith, Fred P: (Constellation Power) <fredp.smith@constellation.com>; lsteffy@srbc.net; 'Williamson, Scott' <scwilliams@pa.gov>; 'Heather Nelson -MDE-' <hnelson@maryland.gov>; tony.prochaska@maryland.gov; 'Brett Coakley -DNR-' <brett.coakley@maryland.gov>; 'Donald Pugh' <don.pugh@outlook.com>; 'Matthew Jargowsky -DNR-' <matthew.jargowsky@maryland.gov>; 'emily.zollweg-horan@dec.ny.gov'; kkuhn@pa.gov; danielle.spendiff1@maryland.gov; Matty Jr, Robert M: (Constellation Power) <robert.matty@constellation.com>; branson.williams@maryland.gov; tsullivan <tsullivan@gomezandsullivan.com>; William Friers <wfriers@gomezandsullivan.com>; bmchail@pa.gov; Bearden, Matthew G <matthew_bearden@fws.gov>; Victoria Westerman -MDE- <victoria.westerman@maryland.gov>

Subject: [EXTERNAL]Re: [EXTERNAL] 2024 FOMP Annual Report for review

EXTERNAL MAIL. Do not click links or open attachments from unknown senders or unexpected Email.

Good afternoon,

Thank you for the opportunity to review the Conowingo Hydroelectric Project Fishway and Operations Plan 2024 Annual Report.

The Service has the following comments/recommendations:

- Sections 2.2.1.3.1 and 2.2.2.3.1 -
 - Please include a figure that shows daily shad catch compared to the proportion of lifts in that day that had a hopper fullness level of 75% or more.
 - Please include a figure that shows daily shad catch with dissolved oxygen and water temperature, similar to the graph that was presented in the annual meeting FOMP presentation on slide 10 for the East Fish Lift. Include a similar figure for the West Fish Lift.
- Appendix B - Please include a plan-view figure to indicate the location of the four different sample locations.

For the 2025 Fish Passage Season:

- Please take representative photos for each of the different categories of hopper fullness at the East Fish Lift
- For the shad and herring transports, please conduct two back-to-back stocking events upstream of Safe Harbor during the stocking rotation. If one out of 5 trucks is to go

upstream of Safe Harbor, do the last truck of the first round of five trucks and then reverse the order in second set of five trucks to have the first truck go upstream of Safe Harbor and the remaining four upstream of York Haven. Continue that routine for the entire season, if possible.

Please let me know if you have any questions.

Sheila Eyler
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