

Muddy Run Pumped Storage Project American Eel Collection Facility in Octoraro Creek, 2025

FERC Project No. 2355



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Submitted On:
January 6, 2026

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Executive Summary

Constellation Energy Generation, LLC (Constellation) received a license from the Federal Energy Regulatory Commission (FERC) on December 22, 2015, for the Muddy Run Pumped Storage Project (Muddy Run Project; FERC Project No. 2355). An American Eel Passage Plan (Eel Plan) was developed by Constellation and included as a condition of the Pennsylvania Department of Environmental Protection (PA DEP) 401 Water Quality Certification (WQC; PA DEP File No. EA 36-033 dated December 10, 2014) for the Muddy Run Project that is a condition of the FERC license for the Muddy Run Project.

Pursuant to the FERC License and the PA DEP 401 WQC, Constellation began operation of a temporary eel trapping facility at Octoraro Creek in 2015. The temporary eel trapping facility at Octoraro Creek operated for three seasons: 2015, 2016, and 2017. An annual report was developed and filed with FERC and resource agencies after each year of operation. On March 1, 2018, FERC issued a letter indicating that the temporary eel trapping facility met the requirements of the PA DEP 401 WQC and United States Department of the Interior (DOI) fishway prescription for the Muddy Run Project. Subsequently, this eel facility location has been considered permanent since 2018. Constellation completed upgrades, including a larger submersible pump, water line, manifold, collection tank, and attraction flow lines, to the permanent Octoraro Creek Eel Facility (OCEF or facility) in support of eel passage prior to the 2019 season. The remaining work left to be completed addresses aesthetics, safety (stairs), and erosion, which has been ongoing since 2018.

In early 2020, Chester Water Authority (CWA), which owns the property where the OCEF is located, notified Constellation of the existence of a buried, abandoned tailrace structure below the existing OCEF. The upgrades to the eel collection structure and the erosion control concerned CWA, because the design drawing showed the footers to be placed on top of or through the underground buried structure. An underground survey needed to be completed prior to installing this structure. The survey was postponed until mid-May 2020 due to the COVID-19 pandemic. The 2020 season was also delayed due to the COVID-19 pandemic. Due to the results of the 2020 underground survey, which confirmed a void under the current location of the OCEF, it was constructed at the top of the hill with agreement from the EPAG and contained one longer ramp of Enkamat substrate in 2020. The OCEF in 2021 contained two longer ramps (12.3 meters compared to 7 meters), one with Enkamat substrate and one with Milieu substrate, both of which were used from 2015 through 2019.

The Conowingo Hydroelectric Project (Conowingo; FERC Project No. 405) license was issued by FERC on March 19, 2021, which is now vacated. Article 419 of this license required Constellation to prepare an American Eel Passage and Restoration Plan, which was developed in consultation with the U.S. Fish and Wildlife Service (USFWS), Maryland Department of Environment (MDE), and other members of the EPAG and was filed with FERC on September 16, 2021. The American Eel Passage and Restoration Plan discuss eel passage at Conowingo and on the east side of the Susquehanna River, which includes the OCEF.

A shoreline stabilization project for the permanent OCEF was completed in August 2022. This work included regrading the eroded shoreline to a suitable slope and placing articulating concrete blocks (ACBs) throughout an approximately 2,000-square-foot area. In addition, upgrades were made to the collection platform to move it upslope to a flat, easily accessible area and to provide a larger

working platform and a larger eel collection tank. In addition, Constellation is planning to enhance/replace the existing working platform with a wooden structure in the future. Prior to the 2024 eel season, the last two rows of ACBs and the large riprap holding them in place were missing due to an erosion event. On May 24, 2024, a jetty like extension was constructed below the entrance of the ramp to create a smooth transition by using existing substrate from the immediate area and held in place with four pieces of 3/4" rebar. This jetty-like extension was reconstructed prior to the 2025 eel season to create a smooth transition to the entrance of the ramp. Additional equipment was installed in 2025 including a water level logger in the tailwater below the ramp entrance, a turbidity meter in the forebay near the submersible pump, and a dissolved oxygen monitor with alarm capabilities. The ramp (both substrate types) was also modified before the start of the 2025 eel season with a quick disconnect system for the lowest 20-foot section in case of forecasted extreme high creek flow forecasts.

Each year, American Eels *Anguilla rostrata* collected at the OCEF are transported to and held at the Conowingo West Eel Collection Facility (CWECF) and subsequently transported upriver and released at designated points in the Susquehanna River watershed.

This report provides details on the following objectives for the 2025 OCEF operational period:

- Install seasonal components of the OCEF immediately downstream of the CWA Pine Grove Low-Head Dam;
- Documentation of any modifications made to the OCEF during the season to improve functionality and eel attraction capability;
- Operate, maintain, and monitor the OCEF daily from May 1 through September 15, 2025;
- Collection of eel catch and length, water quality data, creek flow data, moon phase data, and rainfall during the entire operational period;
- Transport eels collected by the OCEF to the CWECF;
- Conduct weekly quality control checks and cleaning of the OCEF to maintain proper attraction water flow.

Seasonal components of the OCEF included juvenile eel ramps (14.8 meters), a one-horsepower submersible pump and water line, manifold, a collection tank (1,061-liters), and 25 mm attraction flow lines. Additional instrumentation including a water level logger, a turbidity meter, and a DO monitor with an alarm system were used for the duration of the 2025 eel season. The seasonal components along with the additional instrumentation were installed and placed in service on April 30, 2025. The OCEF operated a total of 138 days from May 1 until September 15, 2025.

A total of 101,845 juvenile eels were collected at the OCEF. The greatest number of juvenile eels was collected on June 28, 2025, with 27,937 eels or 27.4% of the total seasonal catch. Two major collection peaks occurred during the periods of June 27-July 1 and July 3-5, which accounted for 83,756 of the 101,845 (82.2%) juvenile eels collected at the OCEF. One minor collection peak occurred during the period of August 15-16, which accounted for 4,721 of the 101,845 (4.6%) juvenile eels collected at OCEF. The collection peaks in 2025 are associated with the decreasing limb of the Octoraro Creek flows, during these receding creek flows the turbidity of the creek is also the greatest, although other decreasing limb of the Octoraro Creek flows occurred but did not increase eel collections. Daily juvenile eel collections of less than 10 individuals were recorded on 79 of the 138 collection days (57.2%). Eel collections greater than 1,000 individuals occurred on 14 of the 138

collection days (10.1%), and eel collections greater than 10,000 individuals occurred on 3 of the 138 collection days (2.2%). Volumetric estimation was used on fourteen days to quantify the number of eels collected during the 2025 season at the OCEF. The ramp entrance was underwater on 32 of the 138 operational days (23.2%) during the 2025 season: four times in May, four times in June, nineteen times in July, and five times in August. These 32 days accounted for 53,261 eels (52.3%) of the 101,845 eels collected.

Length, weight, and injuries (i.e., condition factor) were recorded from biweekly subsamples on 422 juvenile eels. Length of juvenile eels ranged from 88-236 millimeters (mm) with an average length of 125.7 mm. The average weight of juvenile eels was 2.4 grams (g) and ranged from 0.5-18.2 g. Five of the 422 (1.2%) eels showed any form of external injury such as hemorrhaging or marks on body.

A total of 101,836 of the 101,845 eels were transported within 24 hours of capture either to the CWECF where they were held before transport or directly to the mainstem Susquehanna River. Only 9 of the 101,845 (< 0.01%) juvenile American Eel collected at OCEF were removed from the collection tank dead, and no eels died during transport from OCEF during the 2025 season.

Cleaning and calibration of the OCEF was performed weekly. Cleaning of the screened barrel that housed the submersible pump, collection tank, screened drains, and spray bars occurred daily after all eels were removed from the collection tank for transport. The pump, manifold, and attraction flow lines were also cleaned as needed during the season. CWA operated their small hydroelectric facility on 4 (2.9%) of the 138 collection days.

The red-light nighttime survey of the ramp entrance planned for the peak of the eel migration during 2025 season when the eel collection was moderate and the ramp was out of water did not occur. The peak migration period is defined as July and August. July 4th was the only night during this peak migration season that the eel ramp entrance was out of water, and an eel collection was considered moderate.

List of Abbreviations

Agencies/Groups

Constellation	Constellation Energy Generation, LLC
CWA	Chester Water Authority
CWECF	Conowingo West Eel Collection Facility
DOI	United States Department of Interior
EPAG	Eel Passage Advisory Group
FERC	Federal Energy Regulatory Commission
MDE	Maryland Department of Environment
PA DEP	Pennsylvania Department of Environmental Protection
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Units of Measure

C	Celsius
cfs	cubic feet per second
DO	dissolved oxygen
ft	feet
gpm	gallons per minute
in	inches
km	kilometer
L	liter
mg/L	milligrams per liter
mm	millimeter
NTU	Nephelometric Turbidity Unit

Miscellaneous

OCEF	Octoraro Creek Eel Facility
WQC	Water Quality Certification
YSI	YSI Incorporated

1 Introduction

Constellation Energy Generation, LLC (Constellation), received a license from the Federal Energy Regulatory Commission (FERC) on December 22, 2015 for the Muddy Run Pumped Storage Project (Muddy Run Project; FERC Project No. 2355). An American Eel Passage Plan (Eel Plan) was developed by Constellation and included as a condition of the Pennsylvania Department of Environmental Protection (PA DEP) 401 Water Quality Certification (WQC; PA DEP File No. EA 36-033; dated 10 December 2014) for the Muddy Run Project and is a condition of the FERC license for the Muddy Run Project.

The Eel Plan required Constellation to investigate the feasibility of installing and operating a juvenile eel trapping facility on Octoraro Creek. The evaluation was conducted at a location identified on Octoraro Creek immediately downstream of the Chester Water Authority (CWA) Pine Grove Low-Head Dam. This site was approved by the PA DEP and other members of the Eel Passage Advisory Group (EPAG)¹.

The Conowingo Hydroelectric Project (Conowingo; FERC Project No. 405) license was issued by FERC on March 19, 2021, which is now vacated. Article 419 of this license required Constellation to prepare an American Eel Passage and Restoration Plan, which was developed in consultation with the United States Fish and Wildlife Service (USFWS), Maryland Department of Environment (MDE), and other members of EPAG and was filed with FERC on September 16, 2021. The American Eel Passage and Restoration Plan discuss eel passage at Conowingo and on the east side of the Susquehanna River, which includes the Octoraro Creek Eel Facility (OCEF).

American Eel *Anguilla rostrata* collected at the OCEF were transported directly to and held at the Conowingo West Eel Collection Facility (CWECF) and subsequently transported and released at designated points in the Susquehanna River watershed.

The report provides details related to the following objectives for the 2025 field investigation:

- Installation of seasonal components to the OCEF on Octoraro Creek immediately downstream of CWA Pine Grove Low-Head Dam;
- Documentation of any modifications made to the OCEF during the season to improve functionality and eel attraction capability;
- Operation, maintenance, and monitoring of the OCEF daily from May 1 through September 15, 2025;
- Collection of eel catch and length, water quality data, creek flow data, moon phase data, and rainfall during the entire operational period;
- Transportation of eels collected by the OCEF to the CWECF;
- Completion of weekly quality control checks and cleaning of the OCEF to maintain proper attraction water flow.

¹ EPAG members include the Pennsylvania Department of Environmental Protection, United States Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Maryland Department of Natural Resources, Susquehanna River Basin Commission, and Constellation. Maryland Department of Environment was added to the EPAG group on March 19, 2021.

Seasonal components of the OCEF included juvenile eel ramps (14.8 meters), a one-horsepower submersible pump and water line, manifold, a collection tank (1,061-liters), and 25 mm attraction flow lines. Additional instrumentation including a water level logger, a turbidity meter, and a DO monitor with an alarm system were used for the duration of the 2025 eel season. The seasonal components along with the additional instrumentation were installed and placed in service on April 30, 2025.

2 Background

Areas of lower Octoraro Creek from the confluence with the Susquehanna river to the area near CWA's Pine Grove Low-Head Dam were surveyed over a 13-week period from June 16 through September 10, 2014, using Fyke nets, red-light headlamps, and fine mesh dip nets ([Figure 2.0-1](#) and [Normandeau Associates and Gomez and Sullivan 2014](#)). Based on the information gathered during the 2014 survey, eels were consistently found in the north corner of the spillway adjacent to the dam, whereas eels did not seem to be as abundant at the downstream sites during the same period. The report recommended that a site near the dam be considered for future juvenile eel trapping ([Normandeau Associates and Gomez and Sullivan 2014](#)). Constellation and EPAG discussed the possibility of utilizing this north corner of the spillway site for the temporary eel collection facility in 2015. However, due to concerns by the CWA relating to existing structures at the site, an alternative site along the south shore of the Pine Grove Low-Head Dam was selected and approved by the CWA and EPAG. The alternative site was located immediately downstream of the Octoraro Art Association building adjacent to the dam.

The temporary eel trapping facility was across the creek from CWA's small hydroelectric site on Octoraro Creek and operated for three seasons: 2015, 2016, and 2017. An annual report was developed and filed with FERC and resource agencies after each year of operation. On March 1, 2018, FERC issued a letter indicating that the temporary eel trapping facility met the requirements of the PA DEP 401 WQC and U.S. Department of the Interior (DOI) fishway prescription for the Muddy Run Project². The OCEF location has been considered permanent since 2018.

Prior to the 2019 eel season, Constellation completed upgrades to the OCEF related to eel passage, including a larger submersible pump and water line, manifold, collection tank, and attraction flow lines. Work related to facility aesthetics and safety (e.g., stairs) and erosion remains to be completed. This remaining work requires a PA DEP Chapter 105 Wetland and Waterway Obstruction and Encroachment Permit and, therefore, a signed agreement from CWA (the landowner) was necessary so that Constellation could apply for this permit. Constellation received the CWA-signed agreement on December 2, 2019, and applied for the Chapter 105 permit on December 27, 2019. On January 16, 2020, the Chapter 105 Permit application package was deemed complete by PA DEP, and the permitting public comment period closed on March 2, 2020. Constellation received a permit on May 8, 2020. Meanwhile, in March 2020, CWA reviewed the OCEF project plans again and had concerns with the proposed upgraded eel structure plans along the left bank of Octoraro Creek due to an abandoned underground buried tailrace that runs below the proposed gazebo platform. The existing OCEF was revised, and improvement plans were reconsidered for safety and constructability. Constellation had performed studies to identify the exact location of this structure and to determine if it created a void. In early May 2020, the underground survey was scheduled and completed, and the results of the survey were distributed to EPAG prior to a conference call on June 2, 2020. During this conference call, alternative options for the eel facility were discussed, and a decision was made and agreed to by all parties to construct a longer ramp with the collection tank and scaffolding placed at the top of the hill near the driveway. With the scaffolding at the top of the

² On March 1, 2018, FERC issued a letter that stated, "Review of your filing indicates that it fulfils the pertinent WQC and fishway prescription requirements. Pursuant to the PADEP's WQC, because you have determined the Octoraro facility to be successful..." This approval was based on the OCEF being deemed successful and determining it as a permanent installation (Accession number: 20180301-3083; [FERC, 2018](#))

hill and the existing water line exiting at the mid hillside level near the old scaffolding, Constellation agreed to relocate the water line and have it exit at the top of the hill near the new scaffolding. This approach was used to decrease the head loss and increase the total attraction flow of the OCEF, and this work was completed on August 13, 2021.

Constellation conducted a topographic land survey on October 18, 2021, and developed a plan for the OCEF based on this survey. The original shoreline protection design was changed from riprap to articulating concrete block (ACB) to reduce the depth of excavation and lessen the amount of weight placed over the buried tailrace. The shoreline stabilization project for the permanent OCEF was completed in August 2022 after the termination of an in-water work restriction due to the presence of threatened Chesapeake Logperch *Percina bimaçulata* habitat at the site. This work included regrading the eroded shoreline to a suitable slope and placing ACBs throughout an approximately 2,000-square-foot area. In addition, upgrades were made to the collection platform to move it upslope to a flat, easily accessible area to provide a larger working platform. The site was seeded with a PA Piedmont Province shoreline-appropriate native grass mix. The shoreline stabilization was completed in late August 2022, and the OCEF began operations on September 5 and ceased on November 20, 2022; when the Octoraro Creek water temperature at CWA decreased below 10.0 °C for three consecutive days.

The OCEF continuously operated from May 1 until September 15, 2023. The OCEF in 2023 contained two longer ramps, one with Enkamat substrate and one with Milieu substrate, which were the same substrates used from 2015-2022, except for 2020 when only a single Enkamat substrate ramp was used. During set-up of the eel facility in 2024, it was noted that the last two rows of ACBs and the large riprap to hold them in place were missing, due to an erosion event, causing the entrance of the ramp not to be flush with the shoreline. On May 24, 2024, a jetty like extension was created below the entrance of the ramp to create a smooth transition by using existing substrate from the immediate area and held in place with four pieces of 3/4" rebar.

In 2025, the OCEF was set up similar to the 2024 facility including reconstructing the jetty like extension. Additional instrumentations were installed in 2025 including a water level logger in the tailwater below the ramp entrance, a turbidity meter in the forebay near the submersible pump, and a dissolved oxygen monitor with alarm capabilities in the collection tank. The ramp (both substrate types) was also modified before the start of the 2025 eel season with a quick disconnect system for the lowest 20-foot section in case of forecasted extreme high creek flow forecasts.

3 Methods

3.1 Design, Construction, and Installation of Facility

The size of the scaffolding platform was increased in 2022 to an eight foot by ten-foot platform to support the larger collection tank and oxygen supply system ([Figure 3.1-1](#)). A 1,061-liter collection tank replaced the former 310.4-liter tank. This larger tank was installed to minimize holding mortality of eels during periods of high capture rate. A stainless-steel frame was installed in 2023 to support the collection tank. The manifold and submersible pump remained the same as the previous years ([Normandeau Associates Inc. 2020, 2021, 2022, 2023, and 2024](#)). The rainfall gauge was reinstalled each year on the corner of the scaffolding to record daily rainfall events during each collection day.

The longer juvenile eel ramps were constructed and installed with the entrance location near the locations of ramp installations from all previous years. The ramps consisted of two approximately 14.8 meter long by 305 millimeter (mm) wide cable trays positioned at a 28° angle, plus a continuous length of tray that was bent and shaped at a 90° angle over a 25 mm bend radius at the top of the ramp to convey juvenile eels into the collection tank. The entrance of the ramp is defined as convergence of the aluminum conveyance channel and the shoreline substrate but does not include the connectivity of the attraction flow over the extended piece of substrate to the tailwater elevation. The entrances to the ramps were out of water when creek flows taken at the United States Geological Survey (USGS) Gage 01578475 on Octoraro Creek at Richardsmere, MD, located approximately 21 kilometers (km) downstream of CWA's Pine Grove Low-Head Dam were below 182 cubic feet per second (cfs) in 2022 and 2023, and the hydro at CWA was not operating ([Figure 3.1-2](#)). During set up of the facility in 2024, it was noted the last two rows of ACBs and the large riprap holding them in place were missing causing the entrance of the ramp not to be flush with the shoreline, creating an undesirable transition ([Figure 3.1-3](#)). On May 24, 2024, a jetty like extension was created below the entrance of the ramp to create a smooth transition by using existing substrate from the immediate area and held in place with four pieces of 3/4" rebar ([Figure 3.1-4](#)). A smooth transition from the ramp entrances and the jetty was created by ensuring that the material of the ramps was flush to shoreline substrate (gaps were minimized). The entrances were near the shoreline riprap of the tailwater. A continuous piece of Enkamat extended beyond the ramp entrance and continued under the riprap below the ramp entrance, but nothing was placed under the area below the Milieu substrate entrance to prevent excluding eels. In 2025, the jetty-like extension was reconstructed similarly to 2024 ([Figure 3.1-4](#)). Daily photos of the ramp entrance area were taken, but it was evident that the river flows recorded at the USGS gage were not indicative of the conditions occurring at the OCEF. These differences could be due to the hydro operation at CWA, localized rainfall and tributary discharges, or even slight changes to the tailwater stream bed conditions. On July 19, 2025, the entrances to the ramps were underwater when creek flows taken at the United States Geological Survey (USGS) Gage 01578475 on Octoraro Creek at Richardsmere, MD, were at 167 cfs, and the hydro at CWA wasn't operating ([Figure 3.1-5](#)). The ramps were supported by seven T-shaped metal braces evenly spread across the length of the ramps, which were driven through the ACBs and into the ground beneath the ramps ([Figure 3.1-6](#)). On both sides of these braces, a hole was drilled into the flat bar, and a strap was used to fasten the ramps to the braces. The ramps were directly and entirely covered with aluminum from the upper 90-degree bend down to approximately the median discharge elevation of Octoraro Creek to

protect juvenile eels from predation and keep the ramps dark while ascending the ramps. A hinged cover was added to the ramps over the spray bar to decrease light inside the ramp at the top of the ramp, as eels are known to be photophobic.

In 2025, a rubber compression quick disconnect was manufactured at the junction of two ramp sections to help aid in removable of the ramp when extreme high creek flows are forecasted due to rainfall ([Figure 3.1-7](#)). When compressed together the ramp was watertight and visually seamless with the permanently attached substrate.

A 51 mm diameter water line was attached to a 51 mm diameter manifold with seven 25 mm ball valves that supplied water to the spray bars and additional attraction flow lines.

The collection tank was 914 mm wide and 1,829 mm long. The depth of the water in the collection tank was approximately 762 mm, with a volume of approximately 1,061 liters (L). Like in prior years of operation, the collection tank was filled by allowing some of the spray bar flow to enter the collection tank, but a 25 mm collection tank fill line was added in 2022 to supply additional freshwater to the larger collection tank. The collection tank contained two drains comprised of a 76 mm PVC pipe with holes drilled through it which were wrapped in one mm mesh to prevent juvenile eel escapement. The collection tank drain lines were directed to the highest points of the ramps that were possible via gravity feed, which provided eel scent from the eels in the collection tank to the ramps to maximize eel attraction. The collection tank was custom fitted with a lid that was held down by clamps to prevent escapement and predation.

The oxygen supply system provided additional oxygen to the collection tank to minimize holding mortality. An oxygen regulator was attached to an oxygen bottle with a manifold that terminated at a micropore diffuser in the collection tank. A dissolved oxygen (DO) concentration probe was installed connected to a DO meter with an alarm system was designed and installed prior to the start of the 2025 eel season ([Figure 3.1-8](#)). If the DO value in the collection tank fell below 5.3 milligrams per Liter (mg/L), an alarm would be sent by text message to a Normandeau staff member. The DO monitor and alarm system were powered by the same circuit as the submersible pump behind the art association building. No alarms would be able to be sent if power was lost, which was not evident during the 2025 season.

3.2 Data Collection

Daily recorded sample data included date, time of sample, weather, eel counts, water temperature, dissolved oxygen (DO), and rainfall. The data was verified, tabulated, and entered into an electronic format each week as part of a quality control and quality assurance protocol. Environmental conditions such as creek discharge and lunar fraction were also recorded, verified, and entered in an electronic format. Additional data was recorded on the daily field sheet like operation of the CWA hydro unit and if the ramp entrance was underwater.

Eel length and weight measurements, along with condition factors were recorded biweekly from a subsample of a maximum of 25 individuals (when available). Eels were measured and weighed after being anesthetized.

Water temperature and DO were measured in the collection tank and in the head pond near the pump during each sampling event with a YSI water quality meter that was calibrated prior to each sampling event. An Onset HOB0 dissolved oxygen and water temperature logger was added to the

collection tank and continuously recorded data every thirty minutes throughout the duration of the 2024 operational period.

At the request of the resource agencies after the 2024 Octoraro Creek eel season, a turbidity meter and a water level logger were installed near the OCEF. The turbidity meter (Hydrolab MS5) recorded turbidity data on the hour and is deployed in the forebay near the location of the screened barrel and submersible pump used for the attraction flow ([Figure 3.2-1](#)). The water level logger (Onset Hobo U20) was attached to one of the rebar stakes in the tailwater just below the entrance of the ramp ([Figure 3.2-2](#)). The water level logger recorded data hourly along with the control logger (Onset Hobo U20) which was installed on the fence behind the art association building at a standardization reading.

3.3 Juvenile Eel Transport

All juvenile eels captured in the OCEF were either transported to the CWECF where they were held before subsequent transport and release upriver at designated locations in the Susquehanna River watershed or were transported and released directly to the designated locations daily. The determination for these two transportation options was dependent upon current water temperatures; eels were only transported and held at the CWECF during periods when water temperatures were less than 26° Celsius (C). This protocol was developed to minimize holding mortality.

When less than 150 eels were collected during a daily sampling event, the eels were transported in aerated 19 L buckets with lids that contained a maximum amount of water that would prevent eel escapement, with less than or equal to 100 eels in each bucket. When daily collections of juvenile eels were greater than 200 but less than 2,500 individuals, a small, enclosed transport tank (250 L) was utilized. This transport tank was filled to a maximum level that would preclude escapement and was equipped with supplemental oxygen. When daily collections of juvenile eels were greater than 2,500 individuals, a large transport truck and tank (2,500 L) was utilized. This tank was filled completely to prevent sloshing and was equipped with supplemental oxygen to maintain DO levels in the tank.

4 Results

The OCEF commenced operation on May 1 and operated continuously until operations ceased on September 15, 2025. The OCEF was monitored daily during the 138-day season to ensure that it was attracting eels. A total of 101,845 juvenile eels were collected during the 2025 season ([Table 4.0-1](#)). Daily monitoring was conducted as a condition of the OCEF's permanent status.

4.1 Juvenile Eel Collection

A total of 101,845 juvenile American Eels were captured at the OCEF during the 2025 season ([Table 4.0-1](#)). The highest single-day collection of 27,937 juvenile eels occurred on June 28, which accounted for 27.4% of the total 2025 collection season ([Table 4.0-1](#) and [Figure 4.1-1](#)). Volumetric estimations of collected eels, which are indicative of high collection rates, were required on fourteen days (10.1%, [Table 4.1-1](#)). Eel collections greater than 1,000 individuals occurred on twelve of the 138 collection days (8.7%), with eel collections greater than 5,000 individuals on five days within a seven-day period in late June through early July (3.6%, [Table 4.0-1](#)). Daily juvenile eel collections of less than 10 individuals were recorded on 79 of the 138 collection days (57.2%). The collection tank contained no eels on 30 of the 138 collection days (21.7%).

4.2 Juvenile Eel Biological Data

Biological data (length, weight, and condition factors) were recorded from biweekly subsamples. A total of 422 juvenile eels were collected from these biweekly subsamples (0.4% of total eels collected), during 30 of the 138 sample days ([Table 4.2-1](#)).

The average length of juvenile eels was 125.7 mm with a median size of 124.0 mm ([Table 4.2-1](#)). The length of juvenile eels ranged from 88-236 mm. During the 2025 season, seven eels measured greater than 175 mm (1.7%, [Table 4.2-2](#)). Over 92% (389 individuals) of the 422 measured eels ranged between 100-159 mm.

The average weight of juvenile eels was 2.4 grams (g), with a median weight of 2.0 g ([Table 4.2-1](#)). The weight of juvenile eels ranged from 0.5-18.2 g ([Table 4.2-1](#)). During the 2025 season, three eels weighed more than 10.0 g (0.7%, [Table 4.2-3](#)). Nearly 90% (378 individuals) of the 422 juvenile eels weighed between 0.8-3.9 g.

Eels from each biweekly subsample were examined for external injuries. Individual condition factors, date, and detailed biological data for these are shown on [Table 4.2-4](#). External injuries were noted on 1.2% (5 of 422 individuals) of the examined eels. A lesion on the body and a hemorrhage on the operculum were noted on eels on July 7, 2025. A pinch behind the head, an abrasion mark on the body, and a small laceration on caudal tail was observed on June 5, June 19, and June 23, 2025, respectively ([Figure 4.2-1](#)).

4.3 Juvenile Eel Collection by Week

Majority of the juvenile eels were collected during Week 10 (June 29-July 5) when the OCEF collected 52.36% (53,326 individuals) of the season total ([Table 4.3-1](#) and [Figure 4.3-1](#)). Eel collections during Week 9 comprised the second greatest weekly total of 31.51% (32,094 eels) of the season total. No other week collected greater than 10% of the season total. Weeks 1-4, 7, 13, 15, 18-21 each collected less than 0.1% (combined total of 246 eels) of the season total ([Table 4.3-1](#) and

[Figure 4.3-1](#)). Weeks 8, 11, and 16 each collected more than 4,000 eels. Weekly catch data are also provided in [Appendix A](#).

4.4 Peak Periods of Eel Collections

During the 2025 season, the OCEF had two major and one minor collection peak periods. The two major collection peaks occurred during the periods of June 27-July 1 and July 3-5, which accounted for 83,756 of the 101,845 (82.2%) juvenile eels collected at OCEF ([Table 4.0-1](#) and [Figure 4.1-1](#)). One minor collection peak occurred during the period of August 15-16, which accounted for 4,721 of the 101,845 (4.6%) juvenile eels collected at OCEF. The three peak periods accounted for 88,477 of the 101,845 (86.9%) juvenile eels collected at the OCEF.

4.5 Juvenile Eel Catch in Relation to Environmental Factors

[Appendix B](#) contains averaged weekly environmental data from the 2015-2025 operational seasons coupled with the weekly proportions of eel collections at the OCEF and the weekly sum of eels collected at the CWECF, which are discussed further in this section.

Creek Flow

Creek flow and juvenile eel catch were not strongly correlated during the 2025 season. Daily average creek flow was taken from the USGS Gage 01578475 on Octoraro Creek at Richardsmere, MD, ([Table 4.5-1](#)). The highest daily average creek flow value when the OCEF was in operation occurred on July 2 (1,420 cfs, [Table 4.5-1](#)). Major peaks in creek flow occurred during the 2025 eel season on July 1-2 and July 9-10, where the first major peak corresponded to increased eel collections at the OCEF over the days following these elevated flows, but not during the major peak in creek flows ([Figure 4.5-1](#)). The two moderate peaks in creek flow during the 2025 eel season on June 4 and August 13-14, where the first moderate peak did not corresponded to increased eel collections at the OCEF over the days following these elevated flows, but the later moderate peak did have increased eel collections ([Figure 4.5-1](#)). Minor peaks in creek flow occurred during the 2025 eel season on May 29, June 27, and July 31. The minor peak in creek flow in June occurred just previous of the highest collection day at the OCEF in 2025. The two other minor peak periods during the 2025 eel season did not correlate with increases in eel collections ([Figure 4.5-1](#)). Some of the collection peaks in 2025 are associated with the decreasing limb of the Octoraro Creek flows, during these receding creek flows but not all peak flow events contributed to a peak in eel collections.

During Week 11, the highest weekly average creek flow coincided with the third highest weekly catch (5,169 individuals or 5.1% of season total, ([Table 4.0-1](#) and [4.5-1](#) and [Figure 4.5-1](#)). Week 10 produced the highest weekly catch of collection at the OCEF and the second highest weekly average creek flows ([Figure 4.5-1](#) and [Appendix B](#)). The second highest weekly catch of collection occurred during Week 9, which corresponded to the eighth highest weekly average creek flow. Typical of most eel ladders, freshets in Octoraro Creek generally corresponded to greater numbers of eels collected during the 2025 operational period, but higher catch numbers during periods without an increase of flow may be a function of other environmental or behavioral variables.

Lunar Fraction

Juvenile eel catch did appear to be correlated to lunar fraction during the 2025 season. The largest peak in eel capture (56,557 eels collected from June 27-July 1) occurred during the end of Week 9 and the beginning of Week 10, just after the new moon in late June ([Table 4.5-2](#), [Figure 4.5-2](#) and

[Appendix B, Time and Date Website, 2025](#)). Full moon is equal to 1.0 lunar fraction. The second largest peak in eel capture (27,199 eel collected from July 3-5) occurred during the end of Week 10, on the waxing moon of July ([Table 4.5-2](#), [Figure 4.5-2](#) and [Appendix B, Time and Date Website, 2025](#)).

Based on average weekly lunar fraction, Weeks 9 and 13 were the first and second darkest weeks with a total of 32,106 eels (31.5%) of the 101,845 eels collected during these two weeks combined ([Appendix B](#)). Weeks 7, 11, and 3 were the first, second, and third brightest weeks, with a total of 5,251 (5.2%) of the 101,845 eels collected during these three weeks ([Appendix B](#)). Week 10 was ranked the tenth darkest week of the 2025 season, but accounted for 53,326 eels (52.4%) of the 101,845 eels collected ([Appendix B](#)). Typically, the lower illuminance during lower lunar fraction periods (new moon) has been associated with increases in eel catch at eel traps ([Welsh et al. 2015](#) and [Schmidt et al. 2009](#)).

Water Temperature

Water temperature and eel catch did not appear to be correlated this season. Water temperatures ranged from 16.9° Celsius (C) when the season began on May 1 to 27.2° C on July 31, 2025 (Week 14, [Table 4.5-3](#) and [Figure 4.5-3](#)). The highest average weekly water temperature (26.3° C) occurred during Week 13, which was the lowest eel catch week of the peak season ([Appendix B](#)). The OCEF had sustained daily water temperatures above 20.0° C from June 8, 2025, until the facility was shut down on September 15, 2025.

Dissolved Oxygen

Eel collection numbers and DO did not appear to be related this season. DO was recorded as milligrams/Liter (mg/L). These data indicated that the DO readings were typically lower in the source water in the head pond above the dam than those observed in the collection tank for most of the season ([Table 4.5-4](#) and [Figure 4.5-4](#)). The oxygen supply system was added to the collection tank for the 2022 season and was used again in 2025 and operating daily. Daily DO readings are presented in [Table 4.5-4](#) and displayed in [Figure 4.5-5](#). DO levels in the head pond were lower than the collection tank when the oxygen supply system was operated properly ([Figure 4.5-4](#) and [Appendix B](#)). Dissolved oxygen measurements were usually taken in the early morning when the lowest natural DO level was likely to be observed. A dissolved oxygen meter and alarm system was added to the collection tank to send text messages to staff when DO concentration were below 5.3 mg/L. Two alarms were received during the 2025 season on June 28 and July 3, which corresponded to the two highest eel catch days of the season.

Rainfall

Juvenile eel collection and rainfall did not appear to be correlated during the 2025 season. Rainfall was recorded in inches (in) by a rain gauge affixed to the scaffolding platform. The largest rainfall event occurred on August 14, 2025 of 3.8 inches was just prior to a late season increase in eels for two days which accounted for 4,721 eels ([Tables 4.0-1, 4.5-5](#), and [Figure 4.5-6](#)). The 30 days prior to and 30 days after this late season increase in eels accounted for 1,597 eels combined.

The second largest rainfall event occurred on May 29, 2025, but no large increase in eel collections occurred ([Tables 4.0-1, 4.5-5](#), and [Figure 4.5-6](#)). Another rainfall event of over two inches occurred on June 27 just before the largest eel collection day of the 2025 season with 27,937 eels and the first

major peak period of over 54,000 eels. Recorded rainfall amounts over 1.0 inch were observed on ten days during the 2025 season: twice in May, once in June, four times in July, twice in August, and once in September. During 74.6% of the season (103 of the 138 days), the rain gauge recorded values of 0.0 inches.

Turbidity

Juvenile eel collection and turbidity did appear to be correlated during the 2025 season. Nephelometric Turbidity Unit (NTU) was recorded hourly using a Hydrolab MS5 sonde deployed in the forebay. The highest daily average turbidity reading occurred on June 26, 2025 of 146.9 NTU a day prior to the greatest eel collection of 27,937 eels during the 2025 season ([Tables 4.0-1](#), [4.5-6](#) and [Figure 4.5-7](#)). Collection of eels typically increased after a spike in turbidity, especially during late June and early July. The highest average weekly turbidity (Week 10 had the highest turbidity reading (58.8 NTU) occurred during Week 10, which was the greatest eel catch week of the season ([Figure 4.5-7](#) and [Appendix B](#)). Weeks 9-11 were the three highest average turbidity readings which coincided with the three greatest eel catch weeks.

The daily average turbidity reading of the Octoraro Creek at the forebay of the Pine Grove Dam was greater than 20 NTU for 12 days during the 118 days (10.2%) that provided quality readings that accounted for 10,685 of the 72,302 eels (14.8%) collected at that time ([Tables 4.0-1](#) and [4.5-6](#)). The turbidity meter did not record data or provide accurate data on 20 days (14.5%) of the season due to sensor fouling or power loss.

Tailwater level

Juvenile eel collection and daily average creek elevation compared to the ramp entrance did appear to be correlated during the 2025 season. During the 34 of the 138 days (24.6%) when ramp entrance was underwater, the facility collected 65,654 of the 101,845 eels (64.5%, [Tables 4.0-1](#), [4.5-7](#), and [Figure 4.5-8](#)). Ramp entrance is equal to 0.00 feet (ft), and a negative value indicates the ramp entrance is underwater. During Week 11, the highest weekly average creek elevation (-0.659 ft) occurred but only resulted in the third highest collection of eels ([Figure 4.5-8](#) and [Appendix B](#)). During Weeks 5 and 14, the weekly average creek elevation was above the ramp entrance but did not provide a peak in eel collection ([Figure 4.5-8](#) and [Appendix B](#)).

4.6 Juvenile Eel Transport and Mortality

[Table 4.6-1](#) has detailed information of transport and mortality data.

Transport

A total of 101,836 eels (99.99%) of the 101,845 eels collected at the OCEF were transported within 24 hours of capture to the CWECF where they were held before transport ([Table 4.6-1](#)). Transport time from the OCEF to the CWECF was approximately 30 minutes. No juvenile eel mortality occurred when transferring eels from the transport vehicle into the CWECF.

Mortality

Mortality at the OCEF was very low during the 2025 season. Nine eels perished at the OCEF, with one eel on five individual days in June and July, and two eels on June 27 and July 11 ([Table 4.0-1](#) and [Table 4.6-1](#)). All juvenile eels captured at the OCEF were observed to be free of fungus.

4.7 Quality Control Activities

Cleaning and calibration activities were conducted weekly during the season. Scrubbing of the barrel housing the pump, along with the spray bars, was performed prior to performing any calibrations. The attraction flow lines, pump, barrel, and manifold were cleaned as needed during the season.

Calibration of the ramp flow was executed each week after cleaning, using a 15-liter graduated bucket. Multiple locations of each ramp were checked for calibration purposes: the spray bar, the collection tank fill line, the scent line (collection tank drain), and the additional attraction flows at the entrance of the ramp. Detailed calibration records are listed in [Table 4.7-1](#).

The amount of algal growth within the spray bars and collection tank fill were not an issue this season because they are cleaned daily. The flow through the hoses, screened barrel, and pump became a problem with meeting the suggested fishway design attraction flow for an eel facility as the season progressed. To increase the flow of attraction water to the ramps, the pump, the barrel, manifold, and all the attraction flow lines were scrubbed or cleaned with a drain snake as needed during the 2025 season when attraction flows were below expected volumes ([Table 4.7-1](#)). The same submersible pump was used all season.

Actual eel counts were compared to volumetric eel estimates to determine accuracy of the volumetric estimates. A quality control comparison of the volumetric estimate occurred once during the 2025 season: July 11. The detailed estimates for juvenile eels per 200 mL, displacement, total estimated, and actual counts are in [Table 4.7-2](#). With only a small difference observed between estimates and actual counts (1.6%), no further changes to this method are warranted.

4.8 Other Species Caught

Four other aquatic species were caught in addition to American Eel and released to the tailrace of the field stone dam between the ramp entrance and the covered bridge. One hundred eight crayfish spp. (Cambaridae family) were found in the collection tank on 48 occasions during the season. Five Common Musk Turtle *Sternotherus odoratus* were captured in the collection tank on three occasions. Five Northern Water Snake *Nerodia sipedon* were removed from the collection tank on five occasions during the season. Additionally, one Snapping Turtle *Chelydra serpentina* was captured on May 17, 2025.

5 Discussion

The CWECF has one Enkamat ramp compared to the OCEF which contains one Enkamat and one Milieu ramp. Both ramps operated simultaneously from May 1 to September 15. The CWECF continued to operate after the OCEF season was complete. During the dates listed above, the CWECF captured 360,280 eels compared to the OCEF which captured 101,845 juvenile eels during the 2025 season. The OCEF captured approximately 28.3% of the number of eels collected by the CWECF. During this time, the size range of the juvenile eels caught at the CWECF was 65-175 mm with an average length of 115.9 mm ([Normandeau Associates, Inc. 2025 \(draft\)](#)). The average size and range of the juvenile eels caught in the ramp at the OCEF were of a slightly larger size range of 88-236 mm and an average length of 125.7 mm. Overall, the CWECF collected much smaller eels and a slightly smaller size range than the OCEF in 2025.

The collection tank was cleaned, hoses were inspected, and spray bars were examined and cleaned daily to ensure the facility was operating correctly. A routine (weekly) and as needed clean-out of the hoses and manifolds were performed to maintain consistent attraction flows. Minor decreases in attraction flow may be due to the build-up of biological growth in the system. The OCEF was not shaded during the 2025 season.

Water temperature and DO readings were taken daily in the head pond at the pump level and in the collection tank. These data indicated that the dissolved oxygen in the water above the dam was less than the dissolved oxygen observed in the collection tank for most of the season, likely due to the additional oxygen supply system used in 2025 ([Table 4.5-4](#) and [Figure 4.5-4](#)). The oxygen supply system was used starting in mid-June and continued until the end of the season.

The average seasonal creek flow value per the USGS gage station during the 2025 season was about average compared to the previous years of operation (2015-2024). The average creek flow value during the operational period of May 1 through September 15, 2015-2024 was 196.8 cfs compared to the average creek flow value of 185.9 cfs in 2025 ([Normandeau Associates and Gomez and Sullivan 2015, 2016, and 2018a](#) and [Normandeau Associates 2018, 2019, 2020, 2021, 2022, 2023, and 2024](#)). During the 2025 season at OCEF, the daily average creek flow exceeded 1,000 cfs on two back-to-back days in early July. The daily average creek flow was below 100 cfs for fifty-five days compared to 24, 65, 46, 4, 13, 18, 2, 5, 69, and 68 days in 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, and 2024, respectively. CWA operated its hydropower facility on 4 of the 138 days (2.9%) this year, but no relationship was observed between eel catch and hydropower operation ([Table 4.0-1](#)).

The entrance of the ramp was in close proximity to that of previous operational years but was above the tailwater elevation at creek flow less than 167 cfs, which was unlike the years prior to the shoreline stabilization project or localized changes in the immediate tailrace ([Figure 3.1-5](#)). In 2023, the transition of the ramp entrance and the substrate became submerged when the creek flow was approximately 182 cfs, according to the USGS Gage 01578475 on Octoraro Creek at Richardsmere, MD ([Figure 3.1-2](#)). During set up of the facility in 2024, it was noted the last two rows of ACBs and the large riprap were missing causing the entrance of the ramp not to be flush with the shoreline, creating an undesirable transition ([Figure 3.1-3](#)). Multiple options were discussed on how to create a smooth transition, including building a jetty-like structure and fabricating a curved ramp extension. On May 24, 2024, a jetty-like extension was created below the entrance of the ramp to create a

smooth transition by using existing substrate from the immediate area along with pieces of 3/4" rebar ([Figure 3.1-4](#)). A smooth transition from the ramp entrances and the jetty was created by ensuring that the material of the ramps was flush to shoreline substrate (gaps were minimized) even under extreme low tailwater elevations ([Figure 5.0-1](#)). A continuous piece of Enkamat extended beyond the ramp entrance and continued under the riprap below the ramp entrance, but nothing was placed under the area below the Milieu substrate entrance to prevent excluding eels. This jetty-like structure was recreated after the ramp was installed and the season commenced in 2025.

Since 2015, typically when the creek flow has increased, the catch of juvenile eels has also increased within a few days of the flow increase. This was evident during the higher creek flows in June and July. [Figure 5.0-2](#) shows a comparison of 2015 through 2025 weekly catch and average creek flow data.

The number of eels collected (101,845 individuals) in 2025 was the highest annual total since the commencement of this facility ([Table 5.0-1](#)). In 2023, the first full season after the completion of the shoreline stabilization project was completed, and during this season a total of 62,113 were collected. In 2024, the previous record of 84,895 eel was collected during an operational period of 130 days. The shortest season length occurred in 2022 and operated on a shifted schedule (September until mid-November) but did collect a fair number of eels (7,159 individuals) operating outside the normal eel migration season. The OCEF collected an average of 450.1 eels/day in 2023 for the entire 138-day season, and an average of 653 eels/day in 2024 compared to an average of 738 eels per day in 2025. The OCEF collected more than the daily average (738 eels per day) on 15 of the 138 days (10.9% of the season, [Tables 4.0-1](#) and [5.0-1](#)). The average size of eels (125.7 mm) captured in 2025 was slightly larger than the previous four years (2021 – 2024) when the average size of eels was 123.5, 123.9, 122.8, and 125.2 mm, respectively ([Table 5.0-1](#)). From 2015 to 2018, juvenile eels were measured during every sample day (up to 25 eels if available), but only biweekly subsamples of lengths were collected in 2019-2025. The OCEF has caught juvenile eels less than or equal to 100 mm every year. The magnitude of the size range of eels collected and measured in 2025 was comparable to most other years when both substrate ramps were used to collect eels.

The collection tank is 914 mm wide with a length of 1,829 mm. The depth of the water in the collection tank is approximately 762 mm with a volume of approximately 1,061 Liters. The capacity of American Eels in this new, larger collection tank is 10,610 eels under the USFWS guidelines. The capacity of the collection tank was exceeded three times in 2025, with one eel mortality on these high collection days ([Table 4.0-1](#)). The improvements to the OCEF in 2022 helped minimize potential mortality events. The addition of a small oxygen bottle, regulator, and micro pore diffuser helped increase the oxygen levels in the collection tank. Oxygen levels were kept close to 100% saturation and not held at extreme levels. An oxygen bottle system was added to the OCEF which did not change its footprint. Oxygen was controlled and maintained manually and was increased daily when an increase in creek flows was forecasted or when higher eel collections were being recorded. Typically, at most eel ladders, increases of eel captures occur when river flows increase or shortly after these events.

Additional measures with DO collection tank meter and alarm system alerted staff of DO concentration of below 5.3 mg/L on two days (June 28 and July 3) during the 2025 season. On June 27 at 0445 hour, an alarm was sent from the DO system alerting the DO concentration was at 5.3 mg/L or below and then received another alarm at 0545 hour. The staff collecting the eels were notified to adjust the flow rate of the oxygen to the collection tank at Octoraro first thing upon

arriving at the facility. The DO concentration was recorded at 4.65 mg/L at 0630 hour when they arrived at the facility. The crew increased the oxygen flow rate before leaving the site. Eels were very plentiful and were continuing to drop into the collection tank. The last alert was received at 0645 hour. The crew returned to the OCEF at 0900 hour to find the DO concentration in the collection tank was at 6.5mg/L. Only a portion of the eels (roughly 17,000 eels) were removed at this time because the capacity of the large transport truck was met. The remainder of the OCEF eel collection (roughly 11,000 eels) on June 28 was removed at 1430 hour and the DO concentration in the collection tank was 9.7 mg/L. On July 3, 2025, an alarm was received from the DO system at 0745 hour. When the crew arrived at the site at 0820 hour the DO was at 5.2 mg/L.

Multiple monitoring checks were performed during the evening after the large collection occurred on June 29 when the facility collected 14,356 eels. The eel numbers in the collection tank that evening were not high enough to anticipate that the holding capacity of the collection tank would be exceeded.

The Hydrolab MS5 sonde was installed during the 2025 eel season in the forebay of the Pine Grove Dam near to the location of the submersible pump and screen barrel for the attraction flows to the eel ramp. The sonde was suspended by chain and anchor system at the same depth as the submersible pump (approximately five feet below surface elevation). The outside of the sonde was scrubbed daily due to the amount of macrofouling being observed especially from the Chinese Mystery Snails. The meter was calibrated weekly when access was available, and batteries were replaced. Other factors that could provide a questionable reading in turbidity would be the disturbance of sediment by aquatic species and waterfowl.

A water level logger (Onset U20L) was installed in the tailwater below the ramp entrance to record hourly tailwater levels on one of the rebar stakes used to hold the Jetty-like structure in place ([Figure 5.0-1](#)). After installation of the reference logger and tailwater level logger, a RTK was used to standardize the data that would be collected. The Orthometric height of the ramp entrance was 245.666 ft, and the logger sensor elevation was at 244.298 ft or about 1.3 feet below the ramp entrance. At the end of the season, the RTK was used again to confirm these elevations. The logger remained in place all season and the data was downloaded after the season ended. The data was standardized using the reference logger data and the atmospheric pressure data recorded on both loggers. The corrected value for the entrance of the ramp was 0.00 ft and any negative elevation value indicated that the ramp entrance was underwater. The ramp entrance was recorded during daily collections as underwater on 33 of the 138 operational days (23.9%), and the average creek flow for the 2025 operational eel season was 185.9 cfs ([Tables 4.5-1](#) and [5.0-1](#) and [Figure 3.1-5](#)). Entrance was underwater during the 2025 season on 33 occasions: five times in May, four times in June, nineteen times in July, and five times in August ([Table 5.0-2](#)). These 33 days accounted for 53,267 eels (52.3%) of the 101,845 eels collected. The daily average tailwater elevation recorded by the water level logger occurred on 34 days which accounted for 65,654 of the 101,845 eels (64.5%, [Tables 4.0-1](#) and [4.5-7](#)).

Attraction water was flowing when arriving at the OCEF daily. No loss of power events were evident during the 2025 season. When arriving at the facility on August 17, 2025, the crew noted that the collection tank was overflowing due to increased silt and debris in the collection tank. Additionally, large woody debris was removed from ramp entrance after large creek flow events occurred. The OCEF experienced river flows over 2,000 cfs during four flow events in 2025. The

quick connect section of the ramp was not utilized in 2025, due to rain forecast of local storms did not warrant it.

The red-light nighttime survey of the ramp entrance planned for the peak of the eel migration during 2025 season when the eel collection was moderate and the ramp was out of water did not occur. The peak migration period is defined as July and August. The only night during the peak of eel migration that the eel ramp was out of water and a good number of eels were present was July 4, 2025.

6 References

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7 Tables and Figures

Table 4.0-1: Number of Juvenile Eels Caught Daily, Octoraro Creek Eel Facility, 2025

Date	Number of Eels	Date	Number of Eels	Date	Number of Eels	Date	Number of Eels
5/1/2025	0	6/5/2025	11	7/10/2025	723	8/14/2025	20
5/2/2025	0	6/6/2025	3	7/11/2025	<u>1202</u>	8/15/2025	2199
5/3/2025	1	6/7/2025	3	7/12/2025	1109	8/16/2025	2522
5/4/2025	0	6/8/2025	5	7/13/2025*	383	8/17/2025	35
5/5/2025	0	6/9/2025	3	7/14/2025*	110	8/18/2025	736
5/6/2025	0	6/10/2025	0	7/15/2025	40	8/19/2025	95
5/7/2025	1	6/11/2025	8	7/16/2025	102	8/20/2025	18
5/8/2025	0	6/12/2025	2	7/17/2025	101	8/21/2025	4
5/9/2025	0	6/13/2025	13	7/18/2025	31	8/22/2025	5
5/10/2025	0	6/14/2025	25	7/19/2025	11	8/23/2025	2
5/11/2025	0	6/15/2025	36	7/20/2025	2	8/24/2025	11
5/12/2025	1	6/16/2025	21	7/21/2025	0	8/25/2025	8
5/13/2025	0	6/17/2025	33	7/22/2025	2	8/26/2025	17
5/14/2025	0	6/18/2025	59	7/23/2025	1	8/27/2025	3
5/15/2025	21	6/19/2025	5	7/24/2025	0	8/28/2025	2
5/16/2025	4	6/20/2025	2662	7/25/2025	1	8/29/2025	3
5/17/2025	0	6/21/2025	1228	7/26/2025	6	8/30/2025	1
5/18/2025	3	6/22/2025	115	7/27/2025	4	8/31/2025	0
5/19/2025	0	6/23/2025	217	7/28/2025	20	9/1/2025	1
5/20/2025	1	6/24/2025	925	7/29/2025	8	9/2/2025	0
5/21/2025	0	6/25/2025	256	7/30/2025	7	9/3/2025	1
5/22/2025	1	6/26/2025	132	7/31/2025	7	9/4/2025	0
5/23/2025	4	6/27/2025	2512	8/1/2025	75	9/5/2025	0
5/24/2025	4	6/28/2025	27937	8/2/2025	52	9/6/2025	0
5/25/2025	0	6/29/2025	14356	8/3/2025	26	9/7/2025	1
5/26/2025	2	6/30/2025	7945	8/4/2025	15	9/8/2025	0
5/27/2025	1	7/1/2025	3807	8/5/2025	26	9/9/2025	0
5/28/2025	0	7/2/2025	19	8/6/2025	5	9/10/2025	0
5/29/2025	19	7/3/2025	5441	8/7/2025	5	9/11/2025	0
5/30/2025	79	7/4/2025	16830	8/8/2025	3	9/12/2025	0
5/31/2025	53	7/5/2025	4928	8/9/2025	4	9/13/2025	0
6/1/2025	146	7/6/2025	298	8/10/2025	3	9/14/2025	1
6/2/2025*	22	7/7/2025	686	8/11/2025	3	9/15/2025	4
6/3/2025	23	7/8/2025*	737	8/12/2025	3		
6/4/2025	2	7/9/2025	414	8/13/2025	6	Total	101,845

*Days the hydroelectric facility was operating (4 days)
 Volumetric estimates are in italics (14)
 Bolded numbers are peak days.
 The peak periods are shown in boxes.
 QC check is underlined.

Table 4.1-1: Known Eel Numbers in the 200 Milliliter Subsample during Days of Volumetric Estimates, Octoraro Creek Eel Facility, 2025

Date	Number of Eels in 200 mL
6/20/2025	76
6/21/2025	103
6/27/2025	71
6/28/2025	73
6/29/2025	99
6/30/2025	99
7/1/2025	81
7/3/2025	69
7/4/2025	66
7/5/2025	77
7/11/2025	100
8/15/2025	93
8/16/2025	97
8/18/2025	118

Table 4.2-1: Number of Juvenile Eels Captured with Length and Weight Measurements, Octoraro Creek Eel Facility, 2025

	Total
Number eels collected	101,845
Number measured	422
Data Collection Days	30
Length Range (mm)	88-236
Average length (mm)	125.7
Median length (mm)	124.0
Weight range (g)	0.5-18.2
Average weight (g)	2.4
Median weight (g)	2.0

Table 4.2-2: Juvenile Eel Length Frequency, Octoraro Creek Eel Facility, 2025

TL (mm)	Number
85-89	2
90-94	5
95-99	9
100-104	29
105-109	26
110-114	39
115-119	56
120-124	56
125-129	51
130-134	42
135-139	21
140-144	34
145-149	15
150-154	12
155-159	8
160-164	5
165-169	3
170-174	2
175-179	1
180-184	1
185-190	1
195-199	1
200-204	1
205-209	1
235-239	1
Total	422

Table 4.2-3: Juvenile Eel Weight Frequency, Octoraro Creek Eel Facility, 2025

Weight (g)	Number
0.5-0.9	20
1.0-1.4	67
1.5-1.9	111
2.0-2.4	81
2.5-2.9	47
3.0-3.4	39
3.5-3.9	20
4.0-4.4	7
4.5-4.9	12
5.0-5.4	3
5.5-5.9	4
6.0-6.4	4
7.0-7.4	1
8.0-8.4	1
9.0-9.4	1
9.5-9.9	1
14.0-14.4	1
15.5-15.9	1
18.0-18.4	1
Total	422

Table 4.2-4: Observed Injuries of Juvenile American Eels, Octoraro Creek Eel Facility, 2025

Date	Length (mm)	Weight (grams)	Condition Factor
6/5/2025	132	2.1	Dead, Pinched behind head
6/19/2025	116	1.7	Abrasion, midbody bilateral
6/23/2025	115	1.7	Small Laceration, caudal fin
7/7/2025	127	2.2	Lesion mid body
	103	1.2	Hemm on left operculum

5 of 422 eels (1.2%) that were processed had an injury.

Table 4.3-1: Juvenile Eel Collection by Week and Ranks, Octoraro Creek Eel Facility, 2025

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10
Total	1	1	26	13	154	210	56	4044	32094	53326
Rank	T-19	T-19	14	15	10	8	12	5	2	1
Percent Catch (%)	< 0.01	< 0.01	0.03	0.01	0.15	0.21	0.05	3.97	31.51	52.36

	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21
Total	5169	778	12	173	84	4756	895	45	2	1	5
Rank	3	7	16	9	11	4	6	13	18	T-19	17
Percent Catch (%)	5.08	0.76	0.01	0.17	0.08	4.67	0.88	0.04	< 0.01	< 0.01	< 0.01

Top 3 ranked weeks are shown in boxes.

Wk 1: May 1 - May 3
 Wk 2: May 4 - May 10
 Wk 3: May 11 - May 17
 Wk 4: May 18 - May 24
 Wk 5: May 25 - May 31
 Wk 6: June 1 - June 7
 Wk 7: June 8 - June 14
 Wk 8: June 15 - June 21
 Wk 9: June 22 - June 28
 Wk 10: June 29 - July 5

Wk 11: July 6 - July 12
 Wk 12: July 13 - July 19
 Wk 13: July 20 - July 26
 Wk 14: July 27 - August 2
 Wk 15: August 3 - August 9
 Wk 16: August 10 - August 16
 Wk 17: August 17 - August 23
 Wk 18: August 24 - August 30
 Wk 19: August 31 - September 6
 Wk 20: September 7 - September 13
 Wk 21: September 14 - September 15

Table 4.5-1: USGS 01578475 - Octoraro Creek at Richardsmere, MD Gage Flows Daily Average Creek Flows (cfs), 2025

Day	May	June	July	August	September
1	77.7	234	1,020	319	64.6
2	72.7	269	1,420	191	64.6
3	72.8	103	342	156	64.7
4	92.2	939	219	139	65.1
5	113	63.5	162	126	91.0
6	106	62.2	144	119	109
7	86.1	70.8	162	120	116
8	69.1	83.2	588	123	90.3
9	70.5	92.3	1,320	117	78.3
10	90.5	102	1,110	110	78.7
11	87.9	96.5	366	104	73.1
12	78.7	87.9	287	94.2	64.9
13	80.9	81.2	250	540	61.9
14	170	77.0	226	861	60.1
15	220	77.6	220	190	56.9
16	138	88.6	197	131	
17	110	96.6	202	119	
18	90.5	110	185	143	
19	73.2	125	167	129	
20	62.9	165	165	111	
21	68.2	110	157	105	
22	102	90.6	141	100	
23	163	82.4	130	93.7	
24	146	69.3	130	86.5	
25	114	144	120	85.9	
26	96.9	144	120	82.3	
27	94.3	616	155	76.9	
28	239	208	240	71.6	
29	631	124	162	73.2	
30	267	101	135	68.3	
31	311		517	66.5	

Table 4.5-2: Fraction of Moon Illumination, 2025 EST (1.0 Equals Full Moon)

Day	May	June	July	August	September
1	0.225	0.380	0.417	0.542	0.667
2	0.328	0.483	0.516	0.639	0.760
3	0.437	0.583	0.613	0.731	0.845
4	0.544	0.678	0.705	0.815	0.915
5	0.645	0.766	0.789	0.888	0.967
6	0.738	0.842	0.863	0.945	0.982
7	0.820	0.906	0.924	0.965	0.996
8	0.888	0.954	0.968	0.984	0.997
9	0.941	0.970	0.981	0.999	0.969
10	0.978	0.986	0.994	0.990	0.913
11	0.987	0.998	0.997	0.954	0.832
12	0.996	0.990	0.978	0.892	0.731
13	0.996	0.961	0.934	0.809	0.618
14	0.976	0.910	0.869	0.707	0.500
15	0.937	0.841	0.784	0.593	0.383
16	0.880	0.754	0.682	0.474	
17	0.805	0.652	0.569	0.356	
18	0.715	0.541	0.451	0.247	
19	0.614	0.424	0.334	0.154	
20	0.504	0.310	0.225	0.080	
21	0.391	0.204	0.133	0.030	
22	0.280	0.114	0.062	0.004	
23	0.178	0.048	0.016	0.003	
24	0.094	0.010	0.001	0.024	
25	0.034	0.003	0.012	0.066	
26	0.005	0.025	0.047	0.125	
27	0.007	0.074	0.102	0.198	
28	0.042	0.142	0.174	0.282	
29	0.103	0.226	0.257	0.373	
30	0.184	0.319	0.349	0.470	
31	0.278		0.445	0.569	

Table 4.5-3: Water Temperature (°C) from the Collection Tank, Octoraro Creek Eel Facility, 2025

Day	May	June	July	August	September
1	16.9	17.5	25.7	26.1	21.6
2	17.8	17.2	24.7	25.0	21.3
3	18.7	17.4	24.4	24.9	21.4
4	19.4	17.6	24.6	24.6	21.6
5	19.2	18.2	24.6	24.8	22.1
6	18.7	18.8	24.5	24.8	22.6
7	18.6	19.7	25.6	24.3	22.7
8	18.9	20.6	25.4	23.9	21.6
9	19.2	20.0	25.3	23.9	21.5
10	17.8	20.1	25.0	23.7	21.7
11	17.9	20.7	24.7	23.7	21.6
12	18.9	20.7	25.0	24.3	21.3
13	19.2	21.5	25.0	24.8	21.5
14	17.7	21.2	25.4	24.7	21.6
15	19.2	20.6	25.6	25.1	22.0
16	19.5	20.3	26.5	23.5	
17	19.4	20.6	25.6	25.4	
18	20.5	20.9	26.4	25.8	
19	19.4	21.3	26.2	24.5	
20	18.3	22.0	26.1	24.0	
21	19.3	22.5	26.0	23.5	
22	17.7	23.1	26.4	23.1	
23	18.1	24.3	25.6	22.9	
24	17.8	23.6	25.0	22.7	
25	17.4	23.3	25.2	23.0	
26	17.6	23.4	26.6	22.8	
27	18.3	25.5	26.2	22.4	
28	17.9	24.5	26.2	22.0	
29	17.8	24.9	26.7	21.9	
30	17.8	26.2	27.0	21.6	
31	17.7		27.2	21.4	

Table 4.5-4: Water Quality Parameters at Associated Locations at Octoraro Creek Eel Facility, 2025

Day	Time	Collection *		Head Pond	
		Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
5/1/2025	800	16.9	8.25	16.9	8.11
5/2/2025	854	17.8	10.09	17.8	9.71
5/3/2025	741	18.7	7.75	18.7	7.55
5/4/2025	842	19.4	8.18	19.4	7.96
5/5/2025	830	19.2	8.57	19.2	8.51
5/6/2025	840	18.7	8.38	18.7	8.20
5/7/2025	827	18.6	7.79	18.6	7.44
5/8/2025	954	18.9	7.97	18.9	7.90
5/9/2025	800	19.2	7.39	19.2	7.97
5/10/2025	800	17.8	8.39	18.0	8.24
5/11/2025	820	17.9	8.76	18.0	8.62
5/12/2025	928	18.9	7.90	18.8	8.58
5/13/2025	815	19.2	8.00	19.3	7.72
5/14/2025	830	17.7	8.59	17.6	8.62
5/15/2025	832	19.2	8.45	19.1	8.44
5/16/2025	930	19.5	8.75	19.4	8.65
5/17/2025	750	19.4	7.96	19.4	7.75
5/18/2025	915	20.5	7.96	20.3	7.66
5/19/2025	830	19.4	7.45	19.4	7.26
5/20/2025	802	18.3	8.47	18.4	8.26
5/21/2025	737	19.3	6.94	19.3	6.88
5/22/2025	842	17.7	8.12	17.8	8.14
5/23/2025	815	18.1	8.55	18.2	8.50
5/24/2025	813	17.8	8.47	17.9	8.62
5/25/2025	800	17.4	8.32	17.5	8.45
5/26/2025	915	17.6	8.64	17.6	8.84
5/27/2025	758	18.3	8.04	18.3	7.30
5/28/2025	800	17.9	8.47	17.8	8.65
5/29/2025	820	17.8	9.53	17.8	9.30
5/30/2025	730	17.8	8.46	17.8	8.40
5/31/2025	830	17.7	8.34	17.7	8.40
6/1/2025	800	17.5	8.02	17.6	7.32
6/2/2025	800	17.2	7.86	17.3	7.94
6/3/2025	926	17.4	8.78	17.4	8.69
6/4/2025	900	17.6	9.22	17.6	9.29
6/5/2025	835	18.2	8.62	18.2	9.41
6/6/2025	752	18.8	8.57	18.7	8.19
6/7/2025	732	19.7	7.85	19.6	7.54
6/8/2025	820	20.6	7.81	20.5	7.32
6/9/2025	800	20.0	7.10	20.0	7.03
6/10/2025	756	20.1	6.53	20.3	6.24
6/11/2025	900	20.7	6.42	20.7	6.31
6/12/2025	824	20.7	6.28	20.7	6.26
6/13/2025	800	21.5	6.71	21.4	6.05
6/14/2025	810	21.2	7.01	21.1	7.07
6/15/2025	849	20.6	7.25	20.7	7.42

Table 4.5-4. (Continued)

Day	Time	Collection		Head Pond	
		Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
6/16/2025	820	20.3	7.49	20.4	7.17
6/17/2025	950	20.6	7.35	20.6	7.22
6/18/2025	810	20.9	7.08	20.7	6.80
6/19/2025	746	21.3	6.30	21.2	5.60
6/20/2025	800	22.0	5.87	22.0	7.10
6/21/2025	800	22.5	8.47	22.5	6.47
6/22/2025	805	23.1	8.91	23.1	6.95
6/23/2025	758	24.3	7.47	24.2	6.22
6/24/2025	1020	23.6	6.00	25.0	5.53
6/25/2025	825	23.3	7.60	21.2	7.63
6/26/2025	945	23.4	8.57	23.5	5.89
6/27/2025	1015	25.5	8.08	25.6	7.29
6/28/2025	920	24.5	4.65	24.7	7.35
6/29/2025	914	24.9	12.20	24.2	8.20
6/30/2025	1045	26.2	10.70	26.0	7.70
7/1/2025	950	25.7	7.50	25.4	8.00
7/2/2025	1030	24.7	8.10	24.5	7.70
7/3/2025	823	24.4	5.20	Locked out from behind Art Association Building due to high flows and debris on walkway	
7/4/2025	900	24.6	5.60		
7/5/2025	924	24.6	11.40		
7/6/2025	700	24.5	12.10		
7/7/2025	808	25.6	8.40		
7/8/2025	800	25.4	8.90	25.5	7.30
7/9/2025	810	25.3	10.20	25.3	7.20
7/10/2025	1000	25.0	14.00	24.9	8.00
7/11/2025	920	24.7	6.40	24.6	7.50
7/12/2025	938	25.0	8.20	24.8	7.40
7/13/2025	930	25.0	10.30	24.8	7.10
7/14/2025	1048	25.4	10.40	25.2	7.30
7/15/2025	930	25.6	12.50	25.6	7.50
7/16/2025	915	26.5	10.30	26.0	7.10
7/17/2025	809	25.6	11.50	25.6	7.30
7/18/2025	908	26.4	7.40	26.4	7.60
7/19/2025	800	26.2	6.20	25.2	6.40
7/20/2025	800	26.1	6.40	26.0	6.80
7/21/2025	753	26.0	8.40	26.0	5.60
7/22/2025	800	26.4	9.60	26.4	5.40
7/23/2025	749	25.6	9.80	25.6	5.60
7/24/2025	750	25.0	10.80	25.1	6.60
7/25/2025	815	25.2	9.60	25.3	6.10
7/26/2025	745	26.6	9.20	26.5	5.70
7/27/2025	740	26.2	8.70	26.2	5.80
7/28/2025	806	26.2	7.00	26.3	6.90
7/29/2025	754	26.7	7.50	26.8	6.60
7/30/2025	750	27.0	6.70	28.9	5.40
7/31/2025	800	27.2	6.80	27.2	5.70

Table 4.5-4. (Continued)

Day	Time	Collection		Head Pond	
		Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
8/1/2025	752	26.1	7.70	26.2	7.00
8/2/2025	750	25.0	9.60	25.1	7.80
8/3/2025	739	24.9	7.90	24.7	7.80
8/4/2025	800	24.6	8.00	Locked out	
8/5/2025	835	24.8	6.90	24.8	5.90
8/6/2025	800	24.8	7.90	24.8	6.10
8/7/2025	755	24.3	9.30	24.2	6.00
8/8/2025	750	23.9	8.90	24.1	6.40
8/9/2025	757	23.9	10.10	24.1	6.10
8/10/2025	804	23.7	10.00	23.9	6.40
8/11/2025	804	23.7	7.80	23.8	6.20
8/12/2025	805	24.3	6.60	24.2	5.70
8/13/2025	756	24.8	6.40	24.8	5.60
8/14/2025	745	24.7	7.70	24.8	7.00
8/15/2025	800	25.1	7.10	25.0	7.40
8/16/2025	756	23.5	9.20	23.5	6.20
8/17/2025	919	25.4	11.12	25.3	5.90
8/18/2025	805	25.8	11.30	25.8	6.20
8/19/2025	800	24.5	10.20	24.5	6.30
8/20/2025	740	24.0	8.90	24.0	6.40
8/21/2025	758	23.5	8.10	23.6	6.30
8/22/2025	758	23.1	8.80	23.1	6.60
8/23/2025	750	22.9	8.50	22.9	6.40
8/24/2025	751	22.7	7.90	22.8	6.40
8/25/2025	804	23.0	6.20	23.0	6.40
8/26/2025	815	22.8	6.10	22.8	5.90
8/27/2025	800	22.4	6.20	22.4	5.60
8/28/2025	800	22.0	6.90	22.2	6.20
8/29/2025	757	21.9	6.60	22.0	6.20
8/30/2025	745	21.6	6.30	21.6	6.20
8/31/2025	723	21.4	6.30	21.5	5.80
9/1/2025	740	21.6	6.10	21.7	6.00
9/2/2025	814	21.3	7.80	21.4	6.60
9/3/2025	820	21.4	9.70	21.4	6.70
9/4/2025	815	21.6	11.30	21.6	6.40
9/5/2025	800	22.1	9.00	22.1	6.80
9/6/2025	800	22.6	9.80	22.6	6.80
9/7/2025	756	22.7	10.70	22.7	7.20
9/8/2025	800	21.6	12.50	21.6	6.80
9/9/2025	955	21.5	7.90	21.3	6.90
9/10/2025	815	21.7	6.80	21.7	6.50
9/11/2025	806	21.6	7.60	21.6	6.50
9/12/2025	815	21.3	7.60	23.1	6.00
9/13/2025	808	21.5	7.70	21.5	6.00
9/14/2025	736	21.6	9.20	21.6	6.40
9/15/2025	752	22.0	8.90	22.0	5.40

Table 4.5-5: Rainfall (inches) Readings Taken at the Octoraro Creek Eel Facility, 2025

Day	May	June	July	August	September
1	0.0	0.0	0.5	1.7	0.0
2	0.0	0.0	1.7	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0
4	0.2	0.0	0.0	0.0	0.0
5	0.2	0.0	0.0	0.0	0.9
6	0.4	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	1.3
8	0.0	0.0	0.1	0.0	0.0
9	0.6	0.0	1.5	0.0	0.0
10	0.3	0.0	1.1	0.0	0.0
11	0.0	0.0	0.0	0.0	0.2
12	0.0	0.0	0.0	0.0	0.0
13	0.2	0.0	0.0	0.0	0.0
14	1.4	0.0	0.0	3.8	0.0
15	0.2	0.0	0.0	0.3	0.0
16	0.0	0.1	0.0	0.0	
17	0.0	0.3	0.6	0.0	
18	0.0	0.5	0.0	0.5	
19	0.0	0.5	0.0	0.0	
20	0.0	0.8	0.3	0.0	
21	0.0	0.0	0.0	0.0	
22	0.6	0.0	0.0	0.0	
23	0.5	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	
25	0.0	0.0	0.0	0.0	
26	0.0	0.0	0.0	0.0	
27	0.0	2.0	0.3	0.0	
28	0.4	0.0	1.5	0.0	
29	2.5	0.0	0.0	0.0	
30	0.0	0.0	0.0	0.0	
31	0.9		0.0	0.0	

Bolded values represent rainfall amounts greater than or equal to 1.0 inches.

Table 4.5-6: Daily Average Turbidity (NTU) Readings Taken at the Octoraro Creek Eel Facility Forebay, 2025

Day	May	June	July	August	September
1	5.9	2.8	127.3	11.0	4.4
2	5.8*	3.4	91.5*	11.8	5.0
3	5.7	3.7	*	11.9	3.9
4	6.0	2.5	*	9.5	5.1
5	6.8*	1.9	*	*	3.4
6	6.4	1.7	*	2.9*	3.5
7	6.4*	1.1	*	2.2	2.2
8	*	1.4	61.5	1.4	2.9
9	0.7*	1.4	64.6	1.6	3.4
10	0.9	2.2	70.3	2.1	2.3
11	1.2*	3.0	40.7	2.6	2.1
12	*	*	25.8	2.6	1.1
13	*	*	14.9	67.2	1.1
14	3.0*	*	5.4	20.0	0.9
15	1.0	*	0.6	19.7	0.4
16	0.6	*	2.9	11.6	
17	0.8	*	3.9	7.8	
18	1.0	*	4.4	7.3	
19	0.8	2.8	4.1	1.6	
20	0.6	3.0	3.2	1.3	
21	0.8	0.5	*	1.0	
22	0.9	0.1	*	0.8	
23	1.2	*	4.8*	1.7	
24	1.1	*	4.6	0.5	
25	1.0	3.3*	5.2	0.6	
26	1.0	146.9	5.0	1.0	
27	1.1	23.6	27.5	1.9	
28	6.5	16.8	9.4	3.3	
29	8.7	7.9	3.7	3.0	
30	4.2	8.5	7.7	3.4	
31	14.8		15.5	2.5	

*Questionable data or outlier data was removed

Table 4.5-7: Daily Average Water Level Readings (ft) Taken at the Octoraro Creek Eel Facility Tailwater, 2025 (Entrance elevation equals 0.00 ft and negative value is ramp entrance underwater)

Day	May	June	July	August	September
1	0.371	-0.057	-1.295	-0.177	0.326
2	0.383	-0.099	-1.484	-0.035	0.326
3	0.371	0.334	-0.385	0.050	0.337
4	0.234	0.408	-0.095	0.117	0.309
5	0.203	0.576	0.045	0.162	0.147
6	0.250	0.510	0.105	0.187	0.123
7	0.362	0.417	-0.166	0.161	0.119
8	0.469	0.335	-0.986	0.165	0.205
9	0.415	0.278	-1.435	0.187	0.235
10	0.283	0.254	-1.275	0.218	0.255
11	0.337	0.286	-0.517	0.259	0.304
12	0.401	0.328	-0.339	0.324	0.330
13	0.393	0.357	-0.243	-0.203	0.348
14	0.031	0.367	-0.176	-0.767	0.366
15	-0.043	0.376	-0.204	-0.102	0.381
16	0.203	0.321	-0.067	0.035	
17	0.267	0.290	-0.114	0.085	
18	0.375	0.215	-0.070	-0.064	
19	0.478	0.141	-0.002	0.064	
20	0.522	0.057	0.012	0.133	
21	0.471	0.227	0.026	0.165	
22	0.268	0.304	0.095	0.184	
23	0.039	0.337	0.112	0.214	
24	0.148	0.425	0.152	0.281	
25	0.262	0.169	0.176	0.304	
26	0.331	0.270	0.159	0.329	
27	0.406	-0.833	-0.013	0.372	
28	0.085	-0.024	-0.118	0.333	
29	-0.779	0.164	0.041	0.297	
30	-0.124	0.233	0.116	0.320	
31	-0.259		-0.586	0.324	

Bolded values represent daily average tailwater elevation leading to ramp entrance underwater (34 days).

Table 4.6-1: Eel Transport/Stocking Data, 2025

Location of stocking	Number of Eels	No. eels died (mortality)			Removed for analysis	Remove by SRBC	Number stocked
		Collection Tank	Holding Tank	Transport			
Octoraro Creek Collection Tanks	101,845	9 (< 0.01%)					101,836
Transported to Conowingo West Eel Collection Facility				0 (0.00%)			
Conowingo Collection Tank	360,280	187 (0.05%)	89 (0.02%)		99	8,040	351,865
Total Transported from Octoraro Creek and Conowingo West Eel Collection Facility	453,701			16 (< 0.01%)			453,685

Numbers displayed are from May 1 – September 15, 2025
 Bolded value is assumed all dead eels were from the CWECF.

Table 4.7-1: Checking Flows (Gallons per Minute) in the Octoraro Creek Eel Facility, 2025

	DATE									
	4/30/25	5/7/25	5/14*	5/22/25	5/28*	6/4/25	6/11*	6/18*	6/25/25	7/9/2025
Enkamat Ramp										
Spray bar	8.25	8.4	8.0	6.6	6.0	7.5	7.0	6.9	9.6	7.0
Scent line	4.8	2.5	6.0	6.0	4.8	3.5	3.6	5.4	8.4	4.2
Bottom Attraction flow	21.5	18.75	17.5	24.0	24.0	21.0	22.5	21.5	16.8	23.0
Milieu Ramp										
Spray bar	9.0	8.7	7.8	4.2	7.5	6.5	6.0	7.5	9.45	7.5
Scent line	5.5	4.6	4.0	4.1	5.0	5.2	6.0	3.6	6.0	3.8
Bottom Attraction flow	25.0	19.5	19.0	27.0	26.0	28.5	24.0	22.5	18.0	18.0
Collection Tank Fill	7.8	8.4	8.0	5.6	5.1	5.0	7.5	6.75	10.0	5.0
Overall Attraction Flows	71.55	63.75	60.3	67.4	68.6	68.5	67.0	65.15	63.85	60.5

* Cleaned pump, manifold, and hoses to increase flow

	DATE								
	7/16/25	7/23*	7/30/25	8/6*	8/13*	8/20/25	8/27/25	9/3*	9/9/25
Enkamat Ramp									
Spray bar	6.8	9.3	8.0	9.6	8.0	5.55	7.5	6.0	6.5
Scent line	5.0	5.4	5.0	6.2	4.2	7.35	4.6	5.1	4.5
Bottom Attraction flow	21.8	21.0	20.0	17.5	22.0	19.8	17.5	18.5	19.0
Milieu Ramp									
Spray bar	7.2	9.15	7.5	8.7	8.0	5.7	7.0	6.3	6.0
Scent line	4.8	4.6	4.2	5.0	5.0	5.1	5.5	3.5	3.0
Bottom Attraction flow	18.5	19.5	22.5	21.0	24.0	21.0	15.0	21.0	21.0
Collection Tank Fill	6.6	7.0	7.5	7.0	5.0	6.8	12.0	9.9	8.0
Overall Attraction Flows	60.9	65.95	65.5	63.8	67.0	58.85	59.0	61.7	60.5

* Cleaned pump, manifold, and hoses to increase flow

Table 4.7-2: Quality Control Check on Counts, Octoraro Creel Eel Facility, 2025

Date	Number of eels in:		Displacement of Water	Volumetric Estimate	Actual Counts	Difference
	200 mL	1 L				
7/11/2025	100	500	2.1	1182	1202	20
Total				1182	1202	20
						1.6%

All estimated eel counts contain extra eels that were anesthetized and counted.

Table 5.0-1: Comparison of Octoraro Creek Eel Facility, 2015-2025

Watershed area 540 km²
 Approximate Distance from Mouth of Chesapeake Bay to OCEF 341 km

	2015	2016	2017	2018	2021	2020	2021	2022 *	2023	2024 **	2025	Average
Eels Collected	7,197	21,094	11,347	4,203	14,170	3,597	45,230	7,159	62,113	84,895	101,845	32,986.3
Average Size (mm)	129.4	130.9	135.4	141.6	129.9	125.8	123.5	123.9	122.8	125.2	125.7	128.6
Eel length range (mm)	95-232	99-202	99-245	100-259	93-252	91-170	90-190	100-219	95-350	92-175	88-236	
Days of Operation	89	138	138	135	138	95	124	73	138	130	138	121.5
Average eels per day	80.9	152.9	82.2	31.1	102.7	37.9	364.8	99.4	450.1	653	738	253.9
Average creek flow (cfs)	180.9	121.3	138	411	240	224	203	187	127.2	131.4	185.9	195.8
Flow range (cfs)	60-1,490	43-512	51-557	88-2,370	63-1,610	64-3,920	93-1,070	57-687	44-1,470	50-975	57-1,420	
Turbidity (NTU)											0.1-146.9	
Creek Elevation (ft)											-1.5 – 0.58	

*Started operation on September 5, 2022, after the bank stabilization project was completed and continued operation until November 20, 2022.

**Ramp was removed on August 7 and returned to service August 15 due to possible high flows from tropical storm Debby

Table 5.0-2: Occurrence of Ramp Entrance Underwater and Number of Eel Collected, Octoraro Creek Eel Facility, 2025

Date	Number of Eels in Collection Tank
5/15/2025	21
5/23/2025	4
5/29/2025	19
5/30/2025	79
5/31/2025	53
6/1/2025	146
6/25/2025	256
6/27/2025	2,512
6/28/2025	27,937
7/1/2025	3,807
7/2/2025	19
7/3/2025	5,441
7/5/2025	4,928
7/8/2025	737
7/9/2025	414
7/10/2025	723
7/11/2025	1,202
7/12/2025	1,109
7/13/2025	383
7/14/2025	110
7/15/2025	40
7/16/2025	102
7/17/2025	101
7/18/2025	31
7/19/2025	11
7/20/2025	2
7/27/2025	4
7/28/2025	20
8/1/2025	75
8/3/2025	26
8/14/2025	20
8/15/2025	2,199
8/18/2025	736
Total	53,267

Figure 2.0-1: Lower Octoraro Creek from Pine Grove Dam to the Mouth at the Susquehanna River, Octoraro Creek (Stone Masonry Dam Also Known as Pine Grove Low-Head Dam)

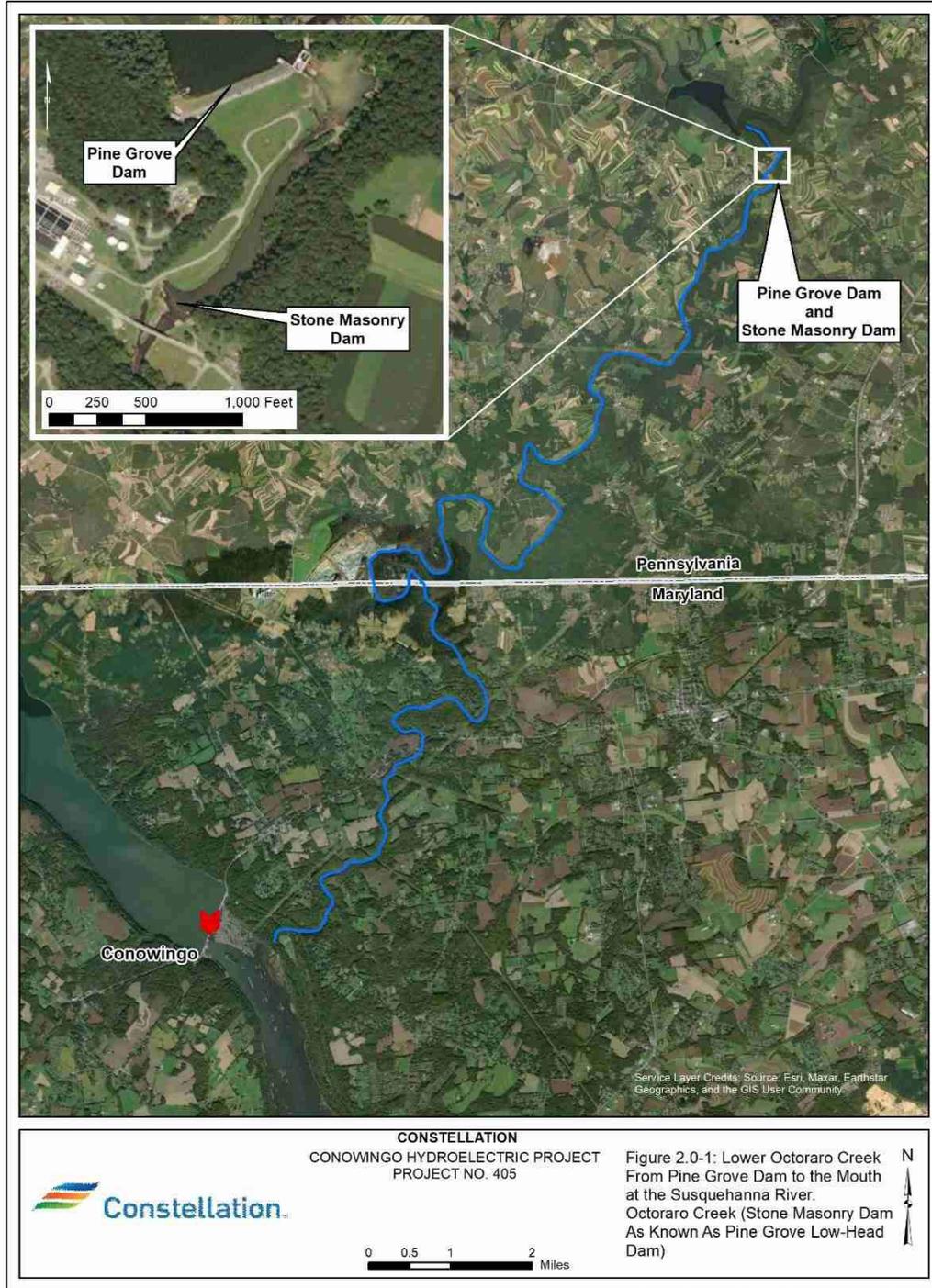


Figure 3.1-1: Overview of the Collection Tank with Support Frame and Scaffolding at top of the hill, Octoraro Creek Eel Facility, 2025



Figure 3.1-2: Ramp Entrance during 2022 and 2023 Eel Collection Seasons at 182 cfs, Octoraro Creek Eel Facility, 2025



Figure 3.1-3: Ramp Entrance at the Start of the Eel Collection Season, Octoraro Creek Eel Facility, April 29, 2024



Figure 3.1-4: Ramp Entrance after completion of the Jetty to Create a Smooth Transition to the Tailwater, Octoraro Creek Eel Facility, May 24, 2024

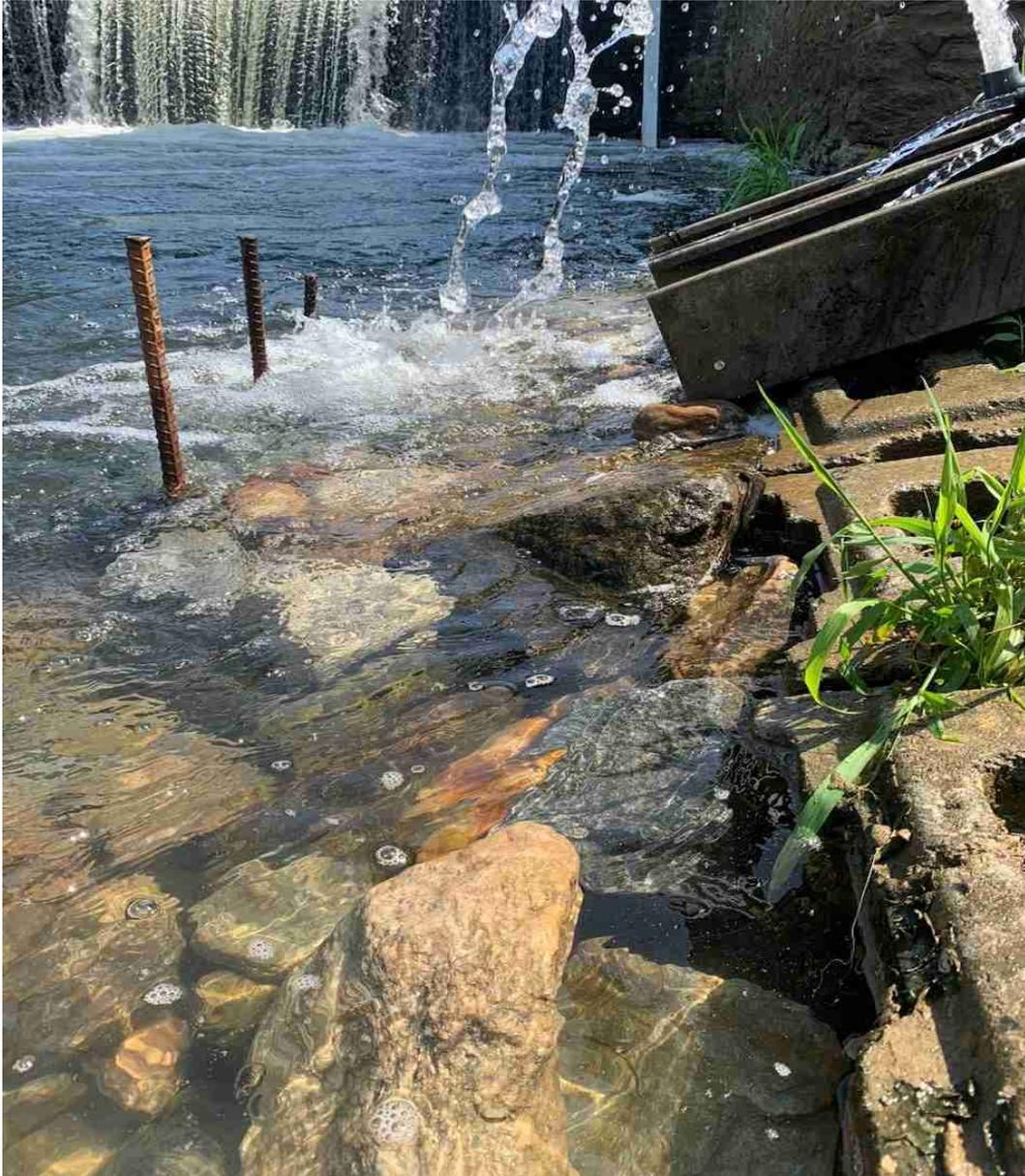


Figure 3.1-5: Ramp Entrance during 2025 Eel Collection Season at 167 cfs, Octoraro Creek Eel Facility, July 19, 2025



Figure 3.1-6: T-bar supports driven through ACBs, Octoraro Creek Eel Facility, 2025



Figure 3.1-7: Watertight Quick Disconnect on the Octoraro Creek Eel Ramp, Octoraro Creek Eel Facility, 2025



Figure 3.1-8: Dissolved Oxygen Meter with Alarm System, Octoraro Creek Eel Facility, 2025



Figure 3.2-1: Water Quality Meter (Hydrolab MS5) Recording Turbidity Readings Installed in the Forebay near Screened Barrel, Octoraro Creek Eel Facility, 2025



Figure 3.2-2: Water Level Logger (Onset U20L) Installed Below the Entrance Area in the Tailwater, Octoraro Creek Eel Facility, 2025



Figure 4.1-1: Daily Eel Catch, Octoraro Creek Eel Facility, 2025

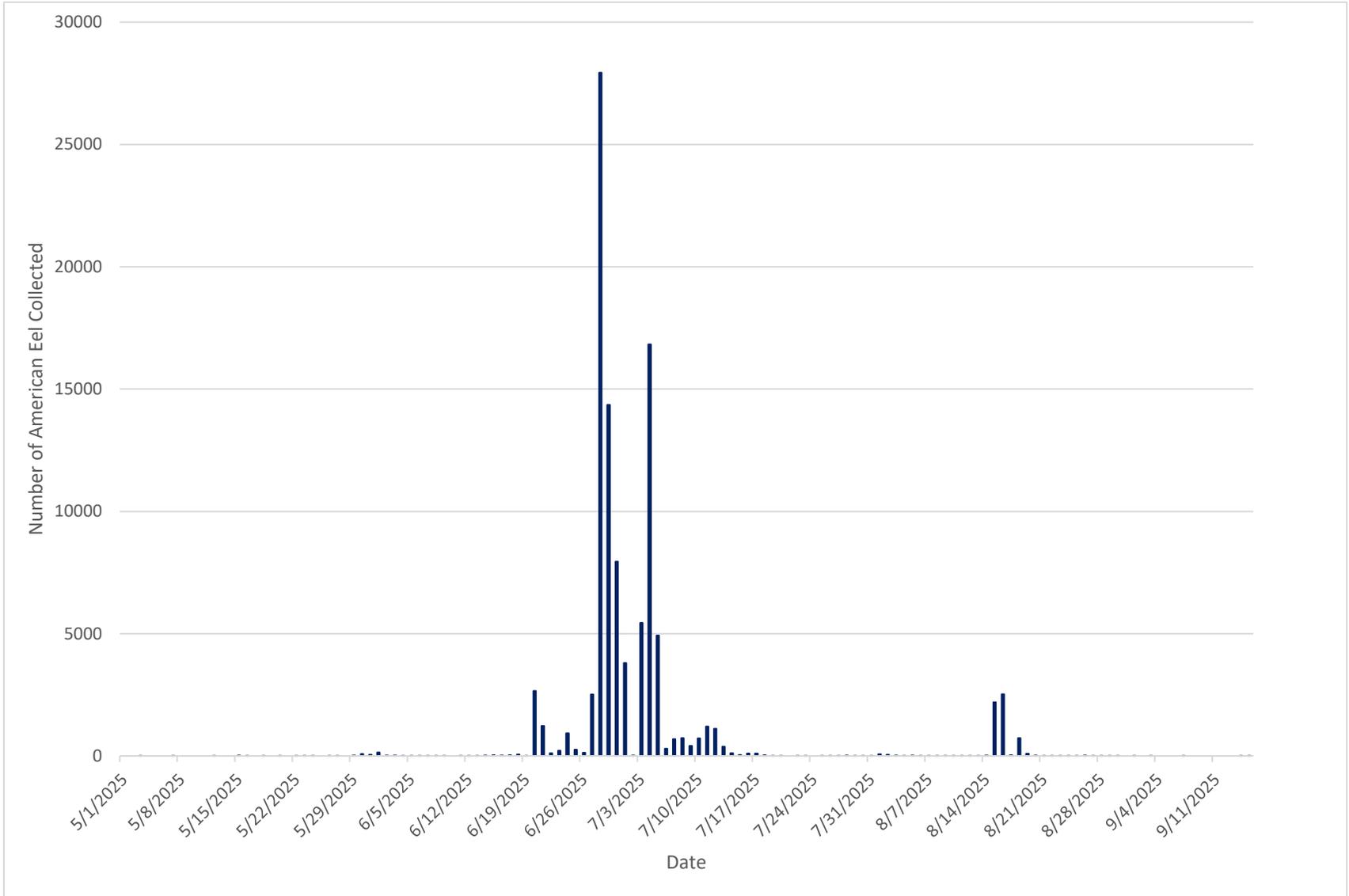


Figure 4.2-1: Image of Dead Eel with Pinch Behind head (above) and Abrasion on mid body (below), Octoraro Creek Eel Facility, 2025

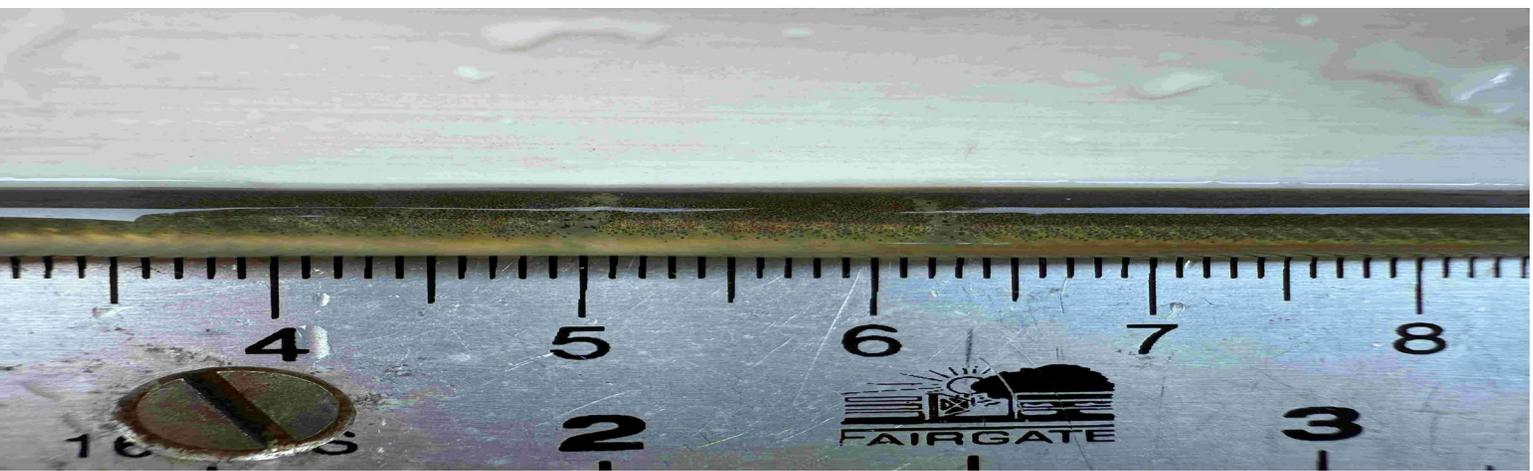


Figure 4.3-1: Percentage Eel Catch per Week, Octoraro Creek Eel Facility, 2025

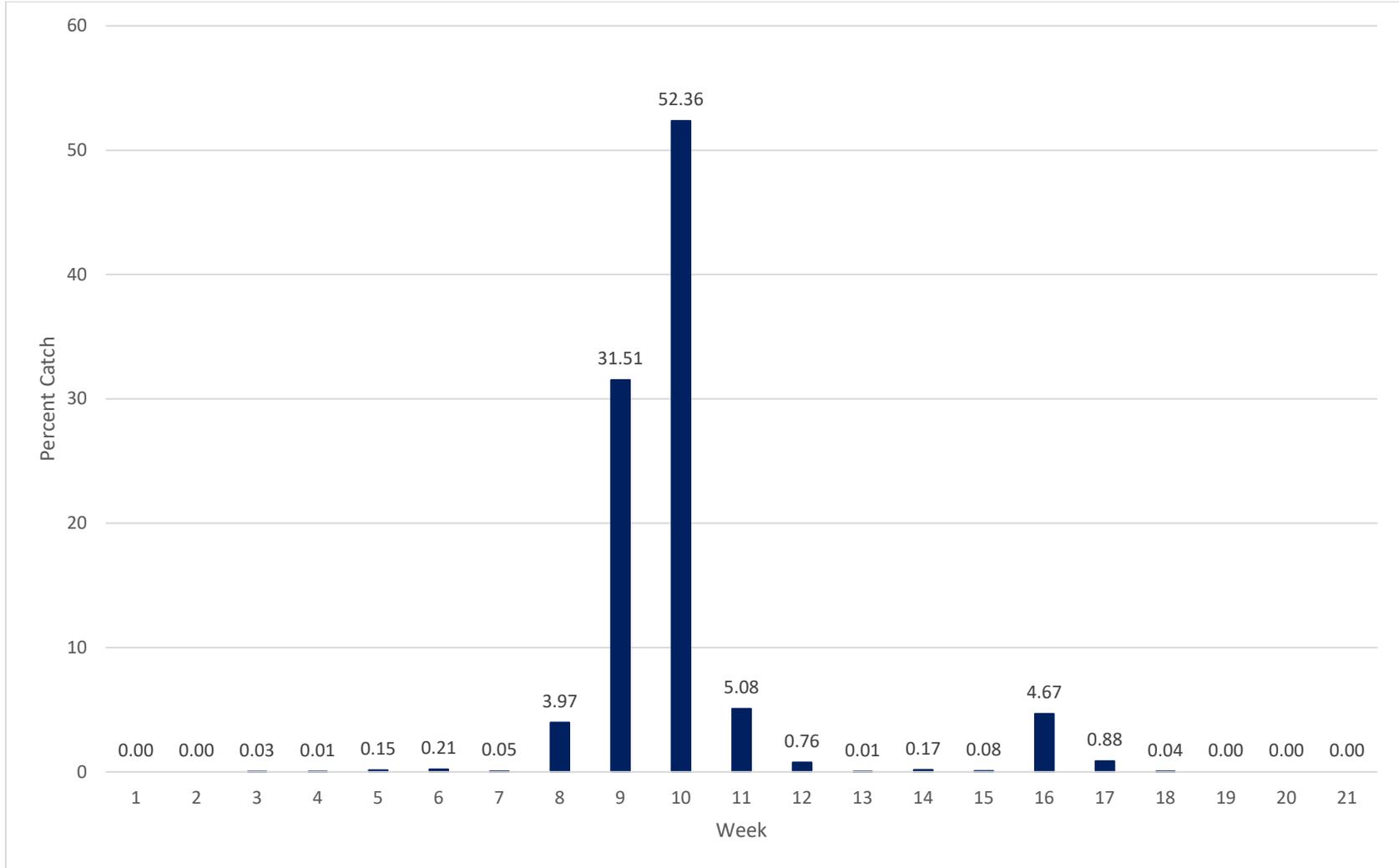


Figure 4.5-1: Daily Eel Catch and Daily Average Creek Flow (cfs, top graph) and Weekly Eel Catch and Weekly Average Creek Flow (cfs, bottom graph), Octoraro Creek Eel Facility, 2025

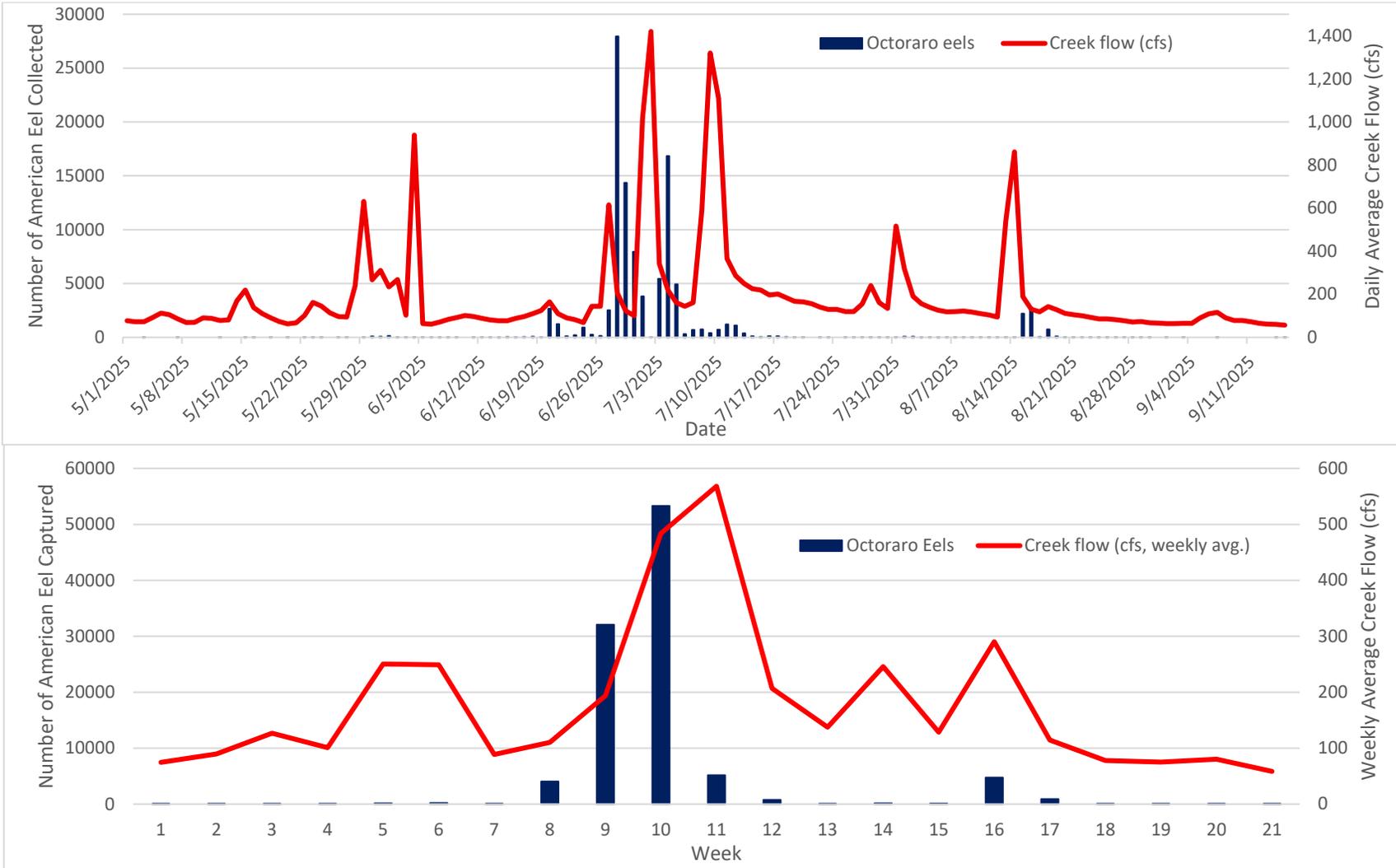


Figure 4.5-2: Eel Catch and Lunar Fraction (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2025 (1.0 Equals Full Moon)

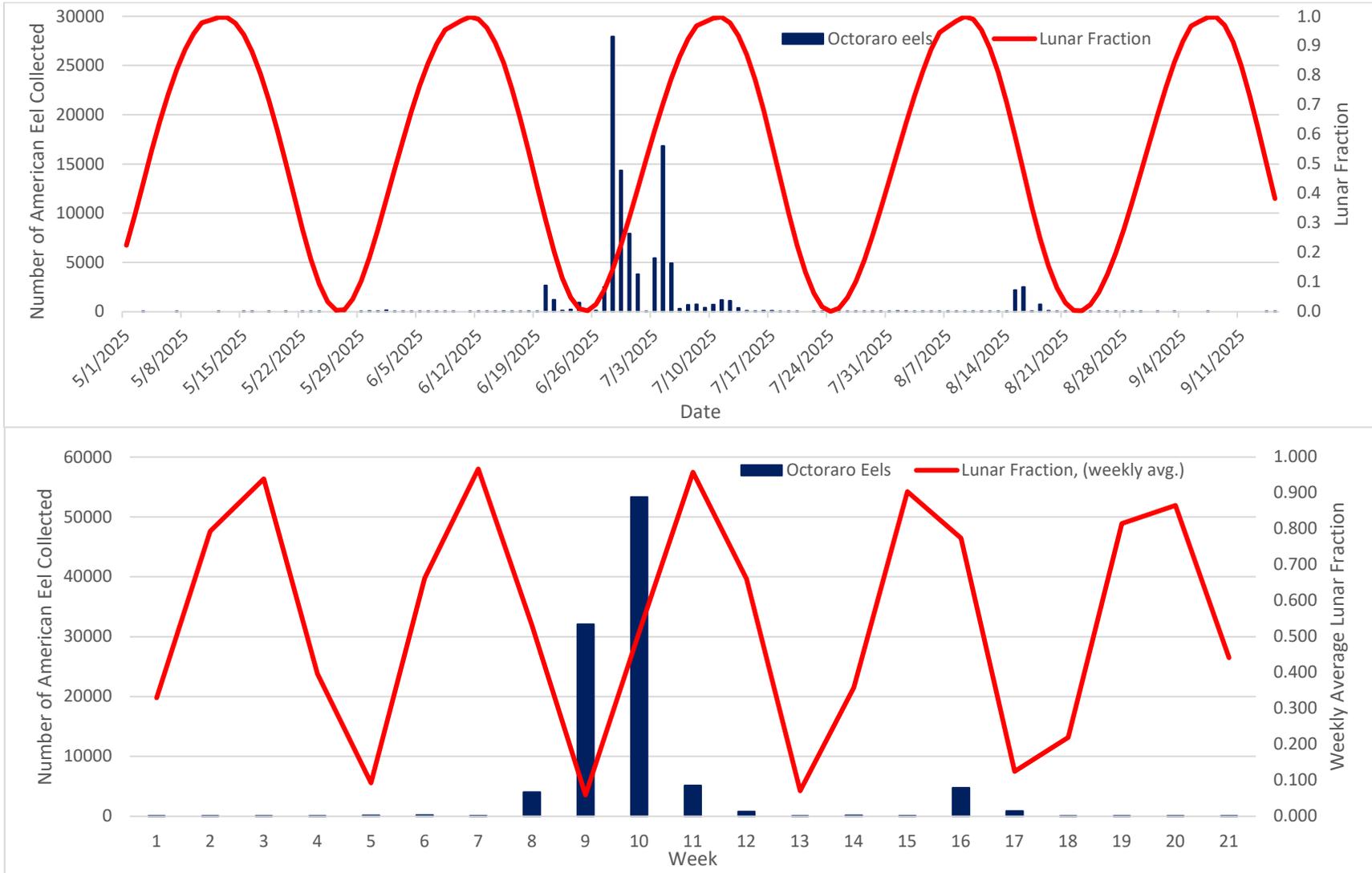


Figure 4.5-3: Eel Catch to Water Temperature (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2025

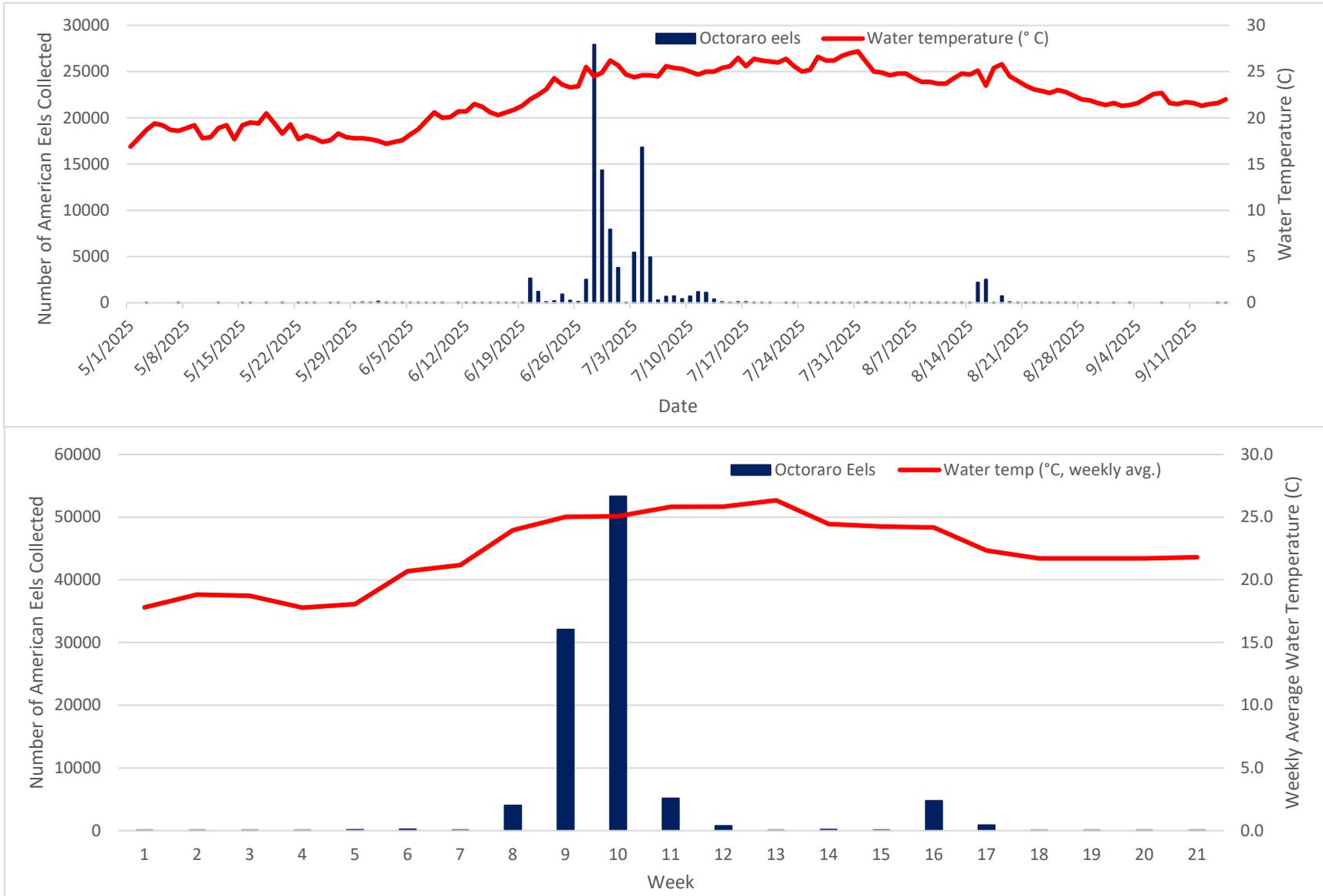


Figure 4.5-4: Comparison of Dissolved Oxygen Readings in Collection Tank and Head Pond, Octoraro Creek Eel Facility, 2025

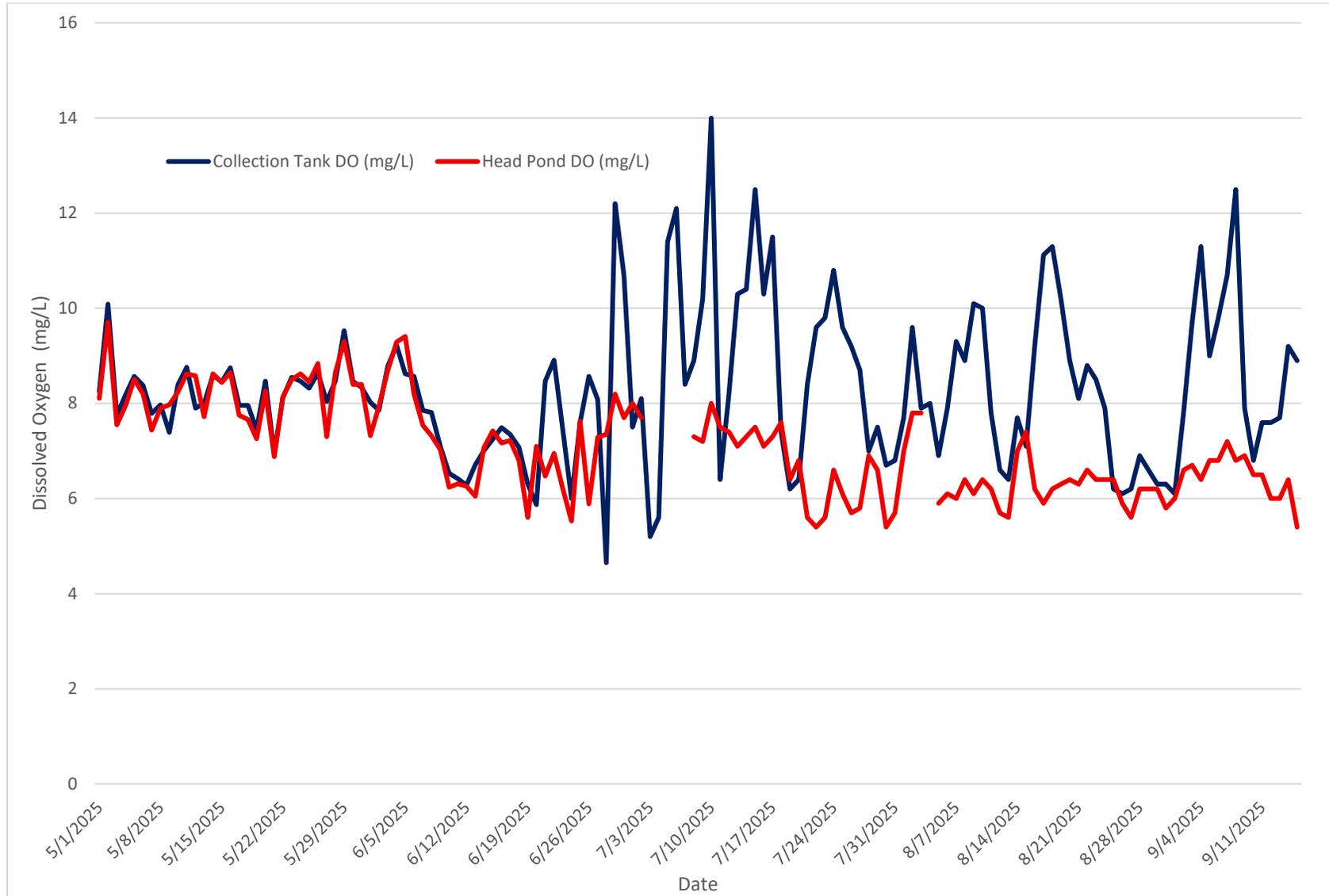


Figure 4.5-5: Eel Catch and Dissolved Oxygen (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2025

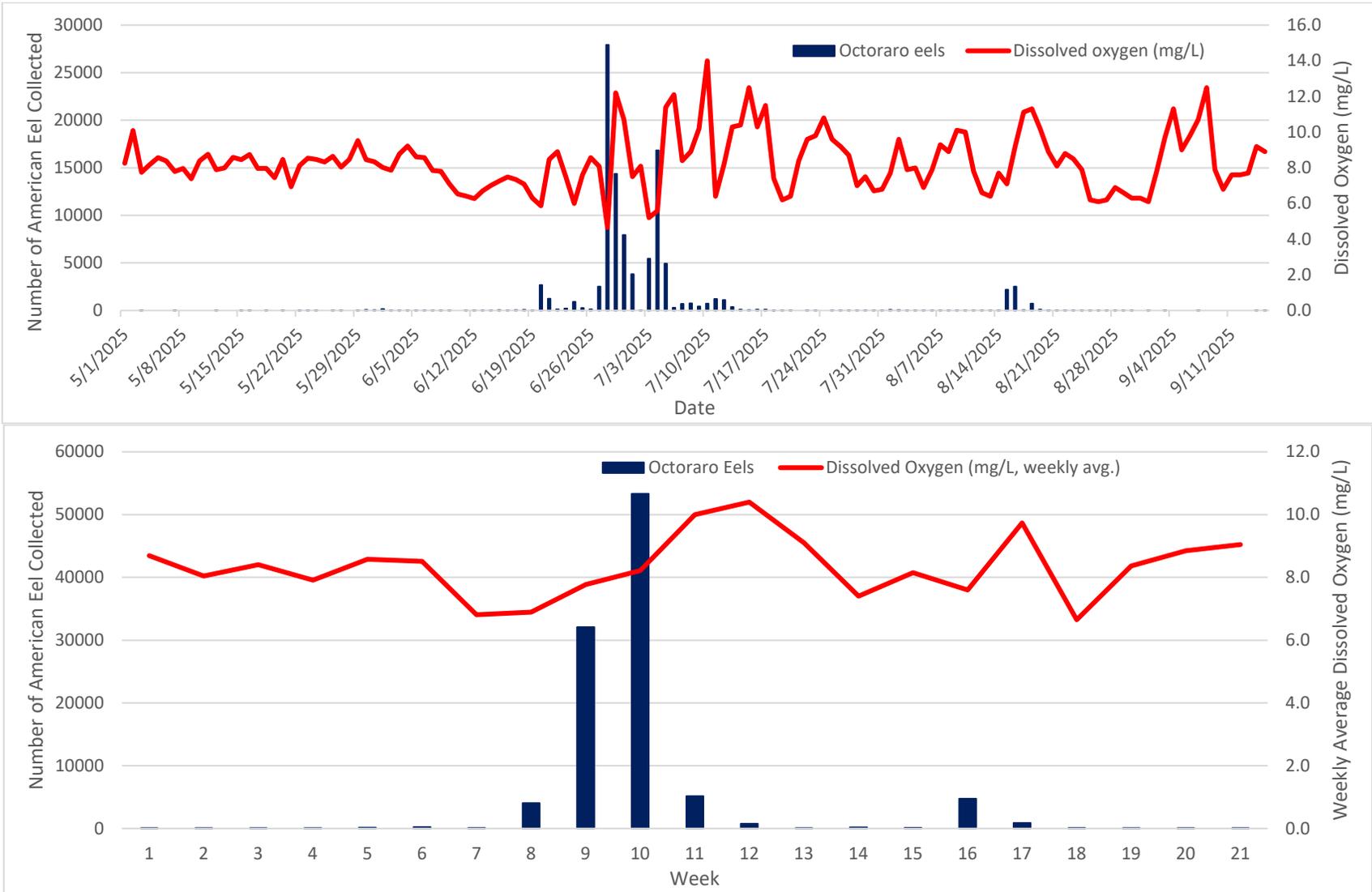


Figure 4.5-6: Eel Catch and Rainfall (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2025



Figure 4.5-7: Eel Catch and Turbidity (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2025

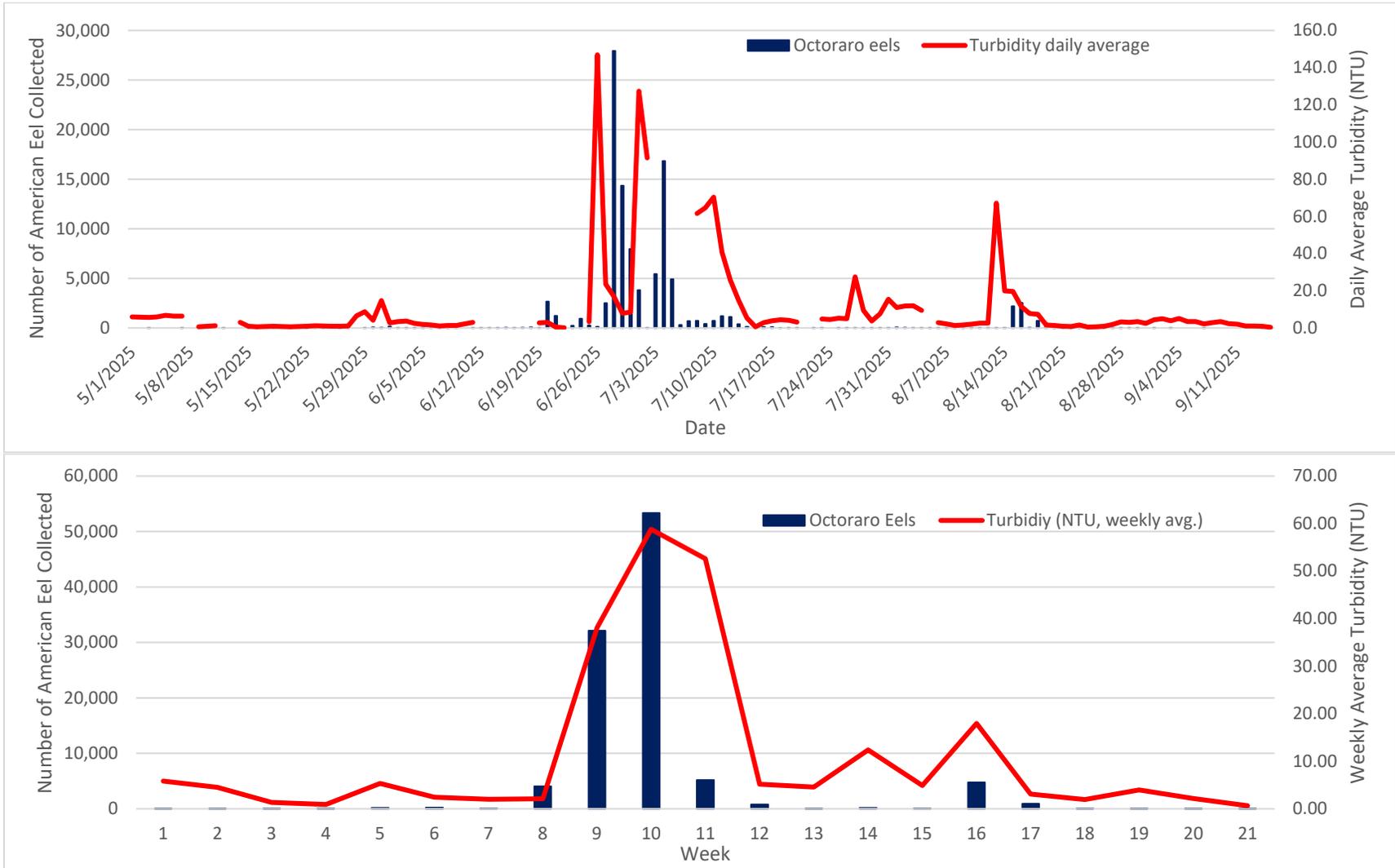


Figure 4.5-8: Eel Catch and Tailwater Elevation (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2025

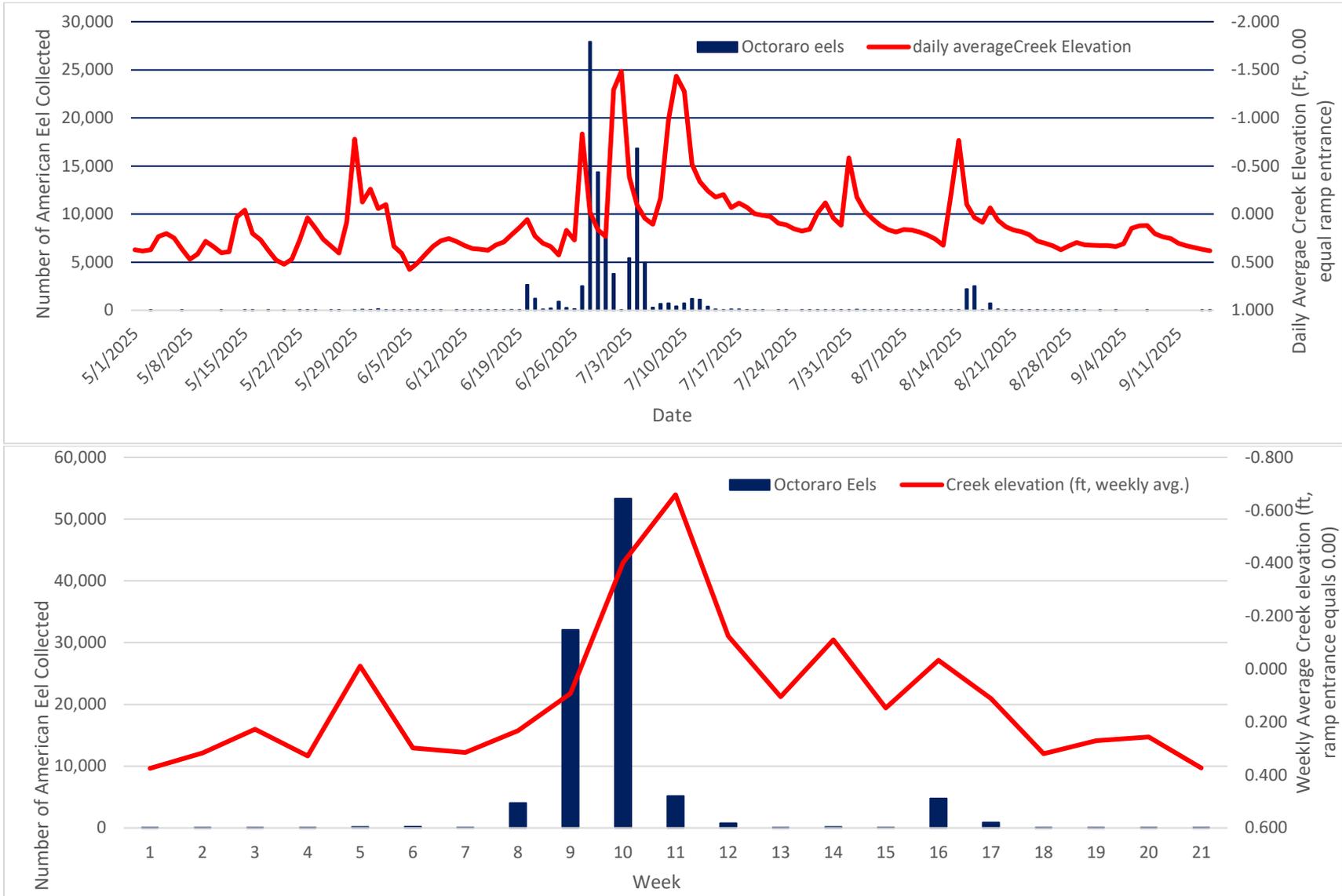
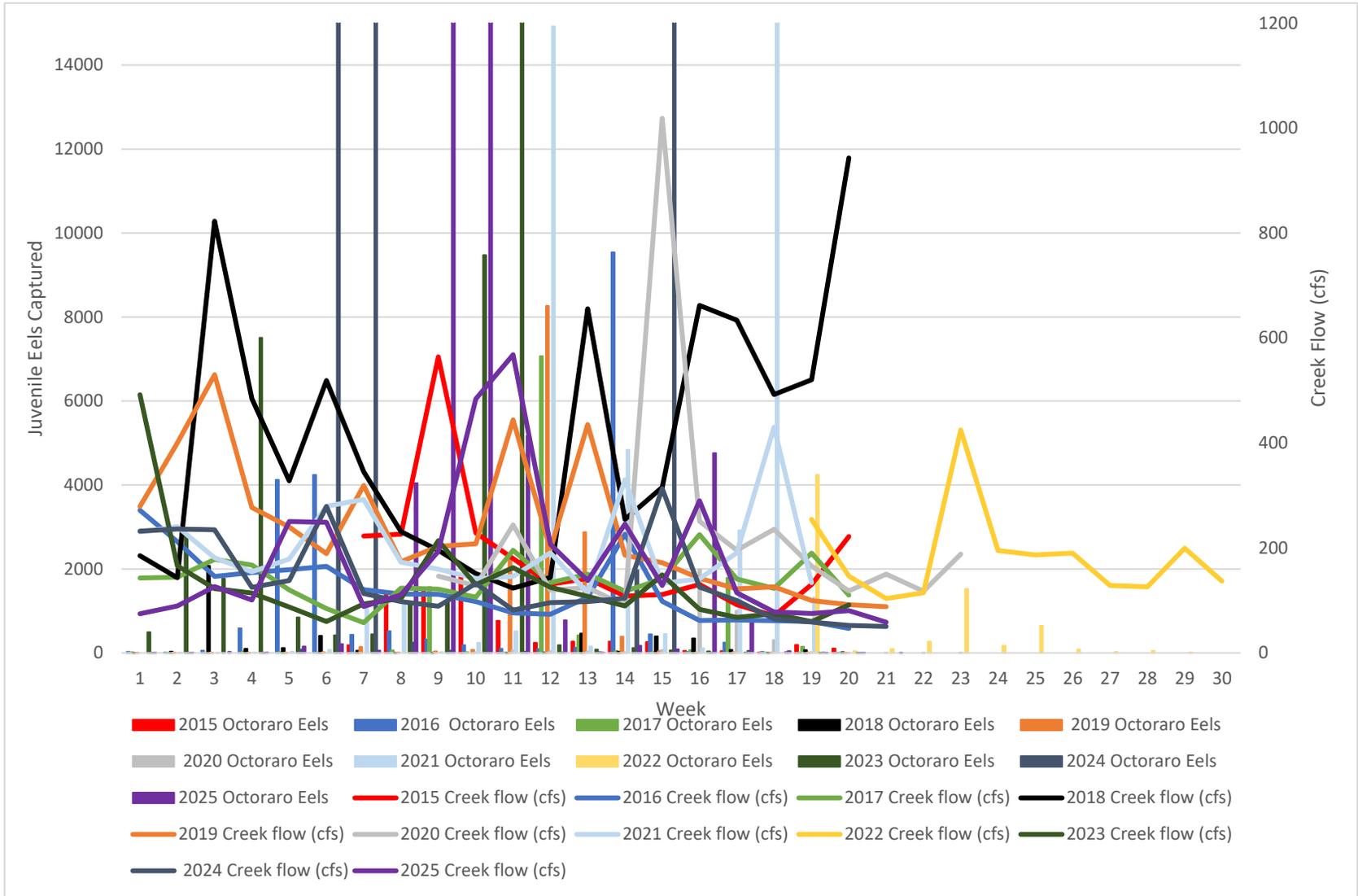


Figure 5.0-1: Ramp Entrance at start of season (77.7 cfs), Octoraro Creek Eel Facility, May 1, 2025



Figure 5.0-2: Weekly Catch and Average Creek Flow, Octoraro Creek Eel Facility, 2015-2025



**Appendix A:
Weekly Biological Data and Environmental Conditions
for Octoraro Creek, 2025**

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Octoraro Eels	1	1	26	13	154	210	56	4044	32094	53326	5169	778	12	173	84	4756	895	45	2	1	5
Creek flow (cfs, weekly avg.)	74.4	89.6	126.5	100.8	250.5	248.8	88.6	110.4	193.5	484.0	568.1	206.7	137.6	245.6	128.6	290.0	114.4	77.8	75.1	80.5	58.5
Lunar Fraction, (weekly avg.)	0.330	0.793	0.940	0.397	0.093	0.663	0.967	0.532	0.059	0.512	0.958	0.660	0.071	0.358	0.904	0.774	0.125	0.220	0.815	0.865	0.442
Water temp (°C, weekly avg.)	17.8	18.8	18.7	17.8	18.1	20.7	21.2	24.0	25.0	25.1	25.8	25.8	26.3	24.5	24.3	24.2	22.3	21.7	21.7	21.7	21.8
Dissolved Oxygen (mg/L, weekly avg.)	8.7	8.0	8.4	7.9	8.6	8.5	6.8	6.9	7.8	8.2	10.0	10.4	9.1	7.4	8.2	7.6	9.7	6.7	8.4	8.9	9.1
Rainfall (in, weekly total)	0.00	1.70	1.75	1.10	3.75	0.00	0.00	2.15	2.00	2.20	2.70	0.60	0.30	3.50	0.00	4.10	0.50	0.00	0.90	1.45	0.00
Percent of Catch	< 0.01	< 0.01	0.03	0.01	0.15	0.21	0.05	3.97	31.51	52.36	5.08	0.76	0.01	0.17	0.08	4.67	0.88	0.04	< 0.01	< 0.01	< 0.01
Turbidity (NTU, weekly avg.)	5.80	4.53	1.32	0.91	5.33	2.44	2.00	2.10	38.14	58.80	52.58	5.17	4.56	12.37	4.92	17.97	3.07	1.96	3.97	2.16	0.65
Creek elevation (ft, weekly avg.)	0.375	0.317	0.227	0.329	-0.011	0.298	0.315	0.232	0.093	-0.402	-0.659	-0.125	0.105	-0.110	0.147	-0.034	0.112	0.319	0.270	0.257	0.374
Conowingo Eels	1734	37738	9122	7732	658	2972	12538	1453	24528	27667	39677	96769	44856	22569	5304	4295	11195	7636	565	1250	22

Wk 1: May 1 - May 3
 Wk 2: May 4 - May 10
 Wk 3: May 11 - May 17
 Wk 4: May 18 - May 24
 Wk 5: May 25 - May 31
 Wk 6: June 1 - June 7
 Wk 7: June 8 - June 14
 Wk 8: June 15 - June 21
 Wk 9: June 22 - June 28
 Wk 10: June 29 - July 5

Wk 11: July 6 - July 12
 Wk 12: July 13 - July 19
 Wk 13: July 20 - July 26
 Wk 14: July 27 - August 2
 Wk 15: August 3 - August 9
 Wk 16: August 10 - August 16
 Wk 17: August 17 - August 23
 Wk 18: August 24 - August 30
 Wk 19: August 31 - September 6
 Wk 20: September 7 - September 13
 Wk 21: September 14 - September 15

**Appendix B:
Weekly Data for 2015-2025**

Weekly Eel Catch Data (2015-2025)

2015 Week							7	8	9	10	11	12	13	14	15	16	17	18	19	20
2015 Octoraro Eels							183	1458	1524	1819	765	240	273	271	258	50	42	13	194	107
2015 Creek flow (cfs)							222.8	225.9	564	228.6	179.7	131	141.9	108.1	111.1	130.4	91.9	70.6	130.6	221.7
2015 Lunar Fraction							0.05	0.48	0.94	0.57	0.05	0.33	0.89	0.69	0.09	0.2	0.8	0.8	0.18	0.01
2015 Water temp (°C)							25.1	23.3	22.7	24.4	24.5	25.3	25.7	25	24.3	24.3	22.8	24.9	23.3	19
Dissolved Oxygen (mg/L)							6.7	7	8.8	7.3	5.1	4.5	4.1	3.3	3.1	5.1	4.3	3.5	5.4	6.8
Percent of Catch							2.5	20.3	21.2	25.3	10.6	3.3	3.8	3.8	3.6	0.7	0.6	0.2	2.7	1.5
Conowingo Eels							2439	8200	5400	3166	4930	1794	284	190	128	327	469	267	59	
2016 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2016 Octoraro Eels	23	13	58	585	4124	4243	431	516	323	183	97	90	121	9540	443	28	247	25	2	2
2016 Creek flow (cfs)	271.7	211.9	145.9	153	158.7	164.7	120.4	112.3	111.4	97.6	76	73.7	106.1	226.3	98.1	61.6	62.7	61.4	59.7	46.6
2016 Lunar Fraction	0.1	0.27	0.85	0.86	0.24	0.15	0.74	0.93	0.35	0.08	0.6	0.95	0.48	0.05	0.45	0.94	0.6	0.06	0.31	0.83
2016 Water temp (°C)	14.5	14.9	15.8	19.3	23.9	22.7	22.8	24.3	24.5	25.7	26.2	27.2	27.7	25.4	26.7	26.7	24.3	24.8	24.8	23.4
Dissolved Oxygen (mg/L)	9.8	10	9.1	7.8	5.3	5.4	6.9	6.3	5.6	5.9	5.6	5	4.7	3	3.9	3.7	3.8	4.4	4	3.8
Percent of Catch	0.1	0.1	0.3	2.8	19.6	20.1	2.0	2.4	1.5	0.9	0.5	0.4	0.6	45.2	2.1	0.1	1.2	0.1	0.0	0.0
Conowingo Eels				5	95	100	113	353	252	247	1061	280	26	25	53	14	31	20	6	3
2017 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2017 Octoraro Eels	17	9	9	39	21	7	2	61	1565	19	13	7067	419	48	16	68	1793	12	149	12
2017 Creek flow (cfs)	142.8	144	178.1	167.4	119.9	84.3	57.6	123.3	121.6	106.3	195.4	133.7	150.3	117.7	140.7	225.4	140.7	122.9	190.3	110.2
2017 Lunar Fraction	0.56	0.96	0.66	0.09	0.37	0.92	0.78	0.16	0.24	0.84	0.88	0.26	0.14	0.72	0.94	0.38	0.07	0.58	0.96	0.56
2017 Water temp (°C)	17.4	14.2	18.8	18.2	18.9	20.2	21.6	24.4	24.9	25.7	25.6	26.9	26.2	25.2	24.1	24	23.3	20.2	20.5	20.4
Dissolved Oxygen (mg/L)	9.5	8.3	7.5	7.5	6.4	5.7	4.4	4.9	5.1	4.5	2.3	5.1	5	4	4.5	5	3	4	6.3	5.5
Percent of Catch	0.2	0.1	0.1	0.3	0.2	0.1	0.0	0.5	13.8	0.2	0.1	62.3	3.7	0.4	0.1	0.6	15.8	0.1	1.3	0.1
Conowingo Eels	4387	151	1224	5384	2196	1761	5199	23318	8090	799	1503	1432	15435	32524	13130	2654	2931	88	51	43
2018 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2018 Octoraro Eels	5	31	2072	101	115	407	55	3	4	0	1	11	464	29	393	343	73	5	69	22
2018 Creek flow (cfs)	185	143	822.6	484.1	327.9	519	345.1	231.3	195.7	150.9	123.3	143.9	655.6	254.3	315.7	661.9	634	492.1	520.4	943
2018 Lunar Fraction	0.89	0.4	0.06	0.6	0.96	0.55	0.06	0.47	0.95	0.69	0.1	0.34	0.91	0.8	0.18	0.22	0.82	0.89	0.29	0.12
2018 Water temp (°C)	15.3	15.9	18.4	19.4	21.4	20.5	20.8	22.6	22.5	25.6	25.5	25.3	24.6	24.9	25.9	25.2	23.2	25.3	24.6	18.2
Dissolved Oxygen (mg/L)	8.8	7.7	7.5	9.4	7.9	8.1	7.4	6.8	7	6.6	6.5	7.1	7.5	6.5	6.2	6.5	5.8	6.4	6.1	10.2
Percent of Catch	0.1	0.7	49.3	2.7	2.7	9.7	1.3	0.7	0.1	0.0	0.0	0.3	11.0	0.7	9.4	8.2	1.7	0.1	1.6	0.5
Conowingo Eels	7	6443	6879	197	398	1316	462	657	1077	6020	3175	1029	7986	20965	5262	3948	1870	165	73	20

(continued)

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(Continued)

2019 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
2019 Octoraro Eels	1	9	5	3	9	20	144	12	36	73	2244	8266	2874	391	42	5	19	12	4	1	0
2019 Creek flow (cfs)	279	400	530	277	240	189	319	174	203	208	444	197	435	186	172	142	122	126	100	92	88
2019 Lunar Fraction	0.07	0.16	0.80	0.85	0.29	0.09	0.69	0.93	0.43	0.06	0.57	0.96	0.58	0.07	0.44	0.95	0.71	0.12	0.31	0.89	0.99
2019 Water temp (°C)	15.50	16.10	14.60	15.70	17.90	19.90	20.00	20.50	21.60	23.00	23.10	23.40	23.70	23.70	23.90	23.90	24.00	23.10	22.90	22.40	22.50
Dissolved Oxygen (mg/L)	9.73	9.36	10.18	10.05	9.26	8.75	8.29	8.52	7.14	6.32	6.13	5.72	6.17	6.29	5.89	5.41	5.87	4.69	5.13	4.93	4.63
Percent of Catch	0.01	0.06	0.04	0.02	0.06	0.14	1.02	0.08	0.25	0.52	15.84	58.33	20.28	2.76	0.30	0.04	0.13	0.08	0.03	0.01	0.00
Conowingo Eels	6	4616	2237	1774	9359	2097	1706	2187	2056	39685	3076	3141	5210	3213	1158	38115	3160	3135	192	40	18

2020 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2020 Octoraro Eels									0	15	64	44	40	20	71	1992	1005	306	22	5	5	2	6
2020 Creek flow (cfs)									146	128.1	244.1	119.3	124.2	90.2	1018.5	250.9	195.5	235.4	165.4	118	150	117.4	187.9
2020 Lunar Fraction									0.35	0.76	0.88	0.32	0.07	0.65	0.94	0.47	0.05	0.52	0.96	0.62	0.08	0.39	0.93
2020 Water temp (°C)									20.7	21.4	22.7	23.8	24.8	25.5	22.5	22.8	23.6	23.5	23.4	21.7	18.6	18.6	18.8
Dissolved Oxygen (mg/L)									7.23	6.04	6.00	5.45	5.90	5.27	6.04	6.87	6.52	7.16	7.60	6.99	6.96	9.02	7.58
Rainfall (inch)									0.01	0.01	0.49	0.00	0.13	0.04	0.62	0.00	0.11	0.25	0.11	0.07	0.00	0.09	0.30
Percent of Catch									0.00	0.42	1.78	1.22	1.11	0.56	1.97	55.38	27.94	8.51	0.61	0.14	0.14	0.06	0.17
Conowingo Eels				2290	20801	36993	10842	3773	1895	4008	15127	7509	36742	17693	29622	31905	24947	6993	2570	223	608	9	101

2021 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2021 Octoraro Eels	0	5	9	13	29	77	1050	1201	21	238	519	14925	154	4836	452	112	2920	17350	1319
2021 Creek flow (cfs)	230	240.6	181.3	154.6	178.6	279.4	292.1	172.9	159.7	141.7	145.7	190.7	114.3	330.0	132.4	141.4	190.4	430.2	133.7
2021 Lunar Fraction	0.76	0.35	0.05	0.52	0.96	0.49	0.04	0.39	0.94	0.64	0.09	0.26	0.89	0.77	0.18	0.16	0.81	0.88	0.44
2021 Water temp (°C)	14.4	15.84	15.04	16.46	18.57	18.61	22.10	21.07	21.69	23.10	23.89	25.89	25.27	24.33	23.83	24.44	25.66	24.96	25.00
Dissolved Oxygen (mg/L)	9.90	9.18	9.40	9.63	8.55	7.28	7.11	7.10	6.81	6.52	6.35	4.48	6.03	5.38	6.30	6.50	6.46	4.25	6.02
Rainfall (Weekly avg.)	0.00	0.31	0.03	0.00	0.28	0.38	0.20	0.15	0.40	0.13	0.00	0.19	0.74	0.28	0.33	0.48	0.04	0.48	0.18
Percent of Catch	0.00	0.01	0.02	0.03	0.06	0.17	2.32	2.66	0.05	0.53	1.15	33.00	0.34	10.69	1.00	0.25	6.46	38.36	2.92
Conowingo Eels	5	46640	15851	17528	42848	29424	23335	18176	2711	5659	75609	63442	59128	50982	26007	12628	3747	19265	58774

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2022 Week	1 - 18	19	20	21	22	23	24	25	26	27	28	29	30
2022 Octoraro Eels	0	4240	46	91	272	1526	175	646	78	26	49	10	0
2022 Creek flow (cfs)		254	146	103	115	425	195	187	190	128	126	199	137
2022 Lunar Fraction		0.87	0.80	0.20	0.14	0.79	0.90	0.34	0.07	0.67	0.96	0.51	0.14
2022 Water temp (°C)		23.75	22.30	21.97	18.84	15.64	13.74	13.29	13.13	12.80	13.51	10.53	8.10
Dissolved Oxygen (mg/L)		7.67	7.15	7.56	7.62	9.41	9.41	9.12	9.84	9.43	10.61	12.05	12.50
Rainfall (inch)		0.63	0.02	0.03	0.29	0.54	0.14	0.07	0.16	0.03	0.14	0.16	0.00
Percent of Catch		59.23	0.64	1.27	3.80	21.32	2.44	9.02	1.09	0.36	0.68	0.14	0.00
Conowingo Eels	112209	747	11478	7353	3631	1035	665	2514	73	69	23	1	0

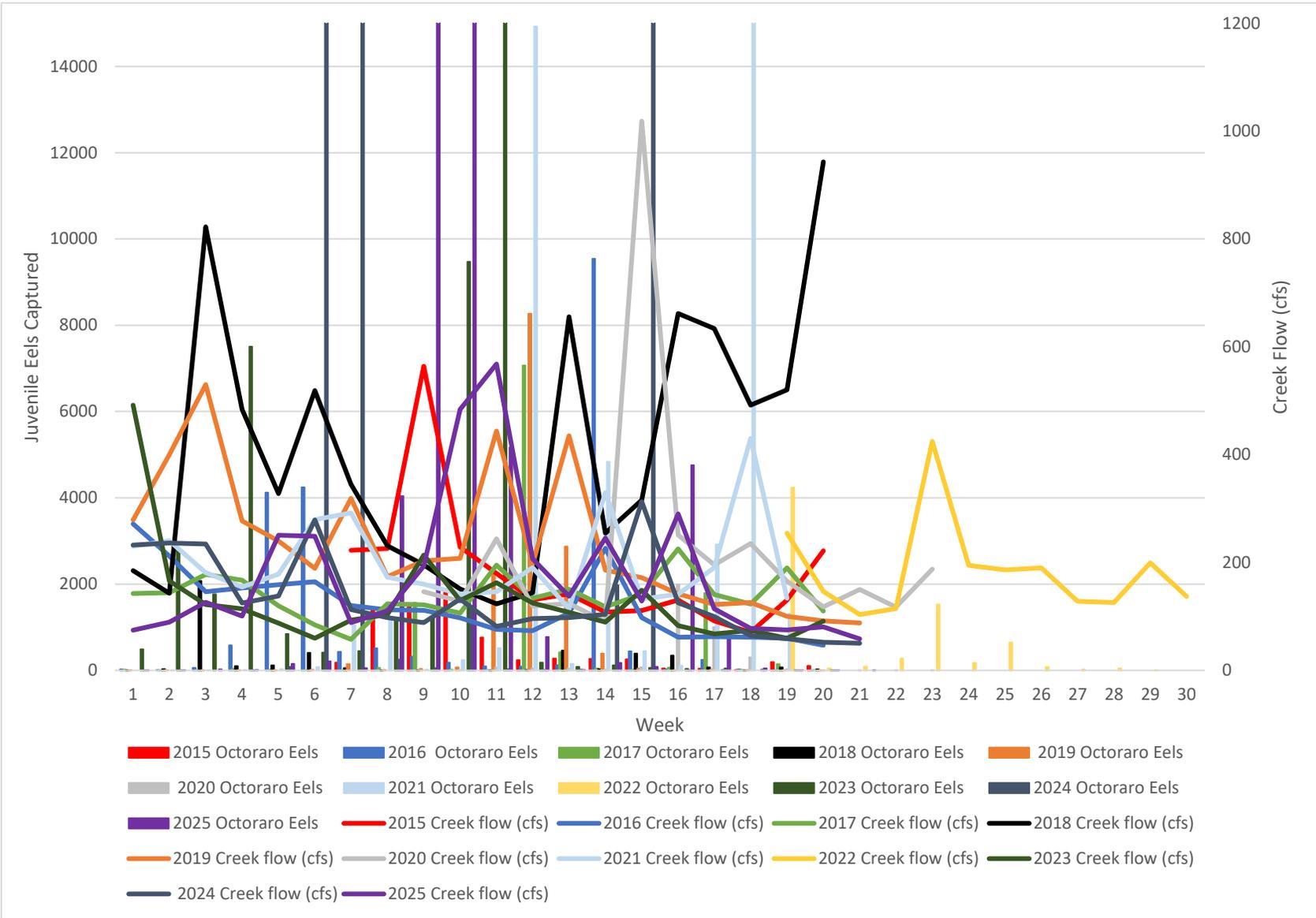
2023 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2023 Octoraro Eels	493	2812	1767	7503	844	417	447	1216	1246	9471	35387	184	82	117	61	35	15	0	9	7
2023 Creek flow (cfs)	491.8	166.0	122.3	114.3	87.5	59.7	93.3	103.6	214.0	129.7	162.7	124.7	107.6	89.5	148.7	82.9	67.8	74.3	59.5	91.6
2023 Lunar Fraction	0.957	0.725	0.093	0.269	0.852	0.821	0.169	0.151	0.744	0.897	0.276	0.073	0.607	0.944	0.407	0.040	0.461	0.952	0.553	0.060
2023 Water temp (°C)	13.6	16.3	14.8	17.3	15.9	16.9	19.9	20.8	20.9	21.6	25.2	26.1	25.6	24.7	23.9	24.2	24.7	24.3	24.4	24.5
Dissolved Oxygen (mg/L)	9.61	9.84	9.15	8.72	8.36	7.33	7.02	7.72	6.67	7.10	7.67	8.80	7.42	6.86	6.47	5.41	5.61	5.41	4.76	5.86
Rainfall (inch)	0.1	0.0	0.1	0.1	0.0	0.2	2.3	1.4	1.3	1.6	2.4	1.3	1.0	0.1	1.9	0.5	0.0	0.2	2.0	0.80
Percent of Catch	0.79	4.53	2.84	12.08	1.36	0.67	0.72	1.96	2.01	15.25	56.97	0.30	0.13	0.19	0.10	0.06	0.02	0.00	0.01	0.01
Conowingo Eels	33	2441	24747	6310	3119	3493	879	928	4499	37844	69566	20518	5805	1110	395	142	4047	11624	2907	3611

2024 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
2024 Octoraro Eels	1	2	0	4	80	34480	17609	249	54	1490	32	13	19	1972	28809	1	48	21	10	1	0
2024 Creek flow (cfs)	232	236	235	125	138	279	113	97.8	88.7	133	81.4	95.9	97.7	104	313	126	99.6	64.5	58.6	52.1	50.4
2024 Lunar Fraction	0.332	0.061	0.543	0.965	0.628	0.064	0.387	0.917	0.746	0.110	0.245	0.830	0.843	0.192	0.135	0.718	0.913	0.304	0.061	0.575	0.942
2024 Water temp (°C)	19.10	17.11	15.23	17.86	20.77	21.80	21.80	23.79	25.26	25.13	27.04	27.13	26.67	26.41	27.28	24.60	23.54	23.29	22.66	20.91	21.00
Dissolved Oxygen (mg/L)	8.15	8.41	8.29	8.47	9.05	6.81	7.25	7.91	7.96	7.97	7.47	6.75	7.59	7.36	5.23	8.08	7.56	6.99	5.86	7.19	6.90
Rainfall (inch)	0.0	1.8	0.4	0.5	0.4	3.6	0.1	0.0	1.7	2.3	0.5	1.6	0.6	2.5	2.9	0.5	0.4	0.0	0.0	0.2	0.0
Percent of Catch	< 0.1	< 0.1	< 0.1	< 0.1	0.1	40.6	20.7	0.3	0.1	1.8	< 0.1	< 0.1	< 0.1	2.3	33.9	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Conowingo Eels	1334	12965	2473	4663	19314	3161	1659	1730	12541	3399	5377	2519	1072	11459	6991	36312	125604	54025	41467	16855	1090

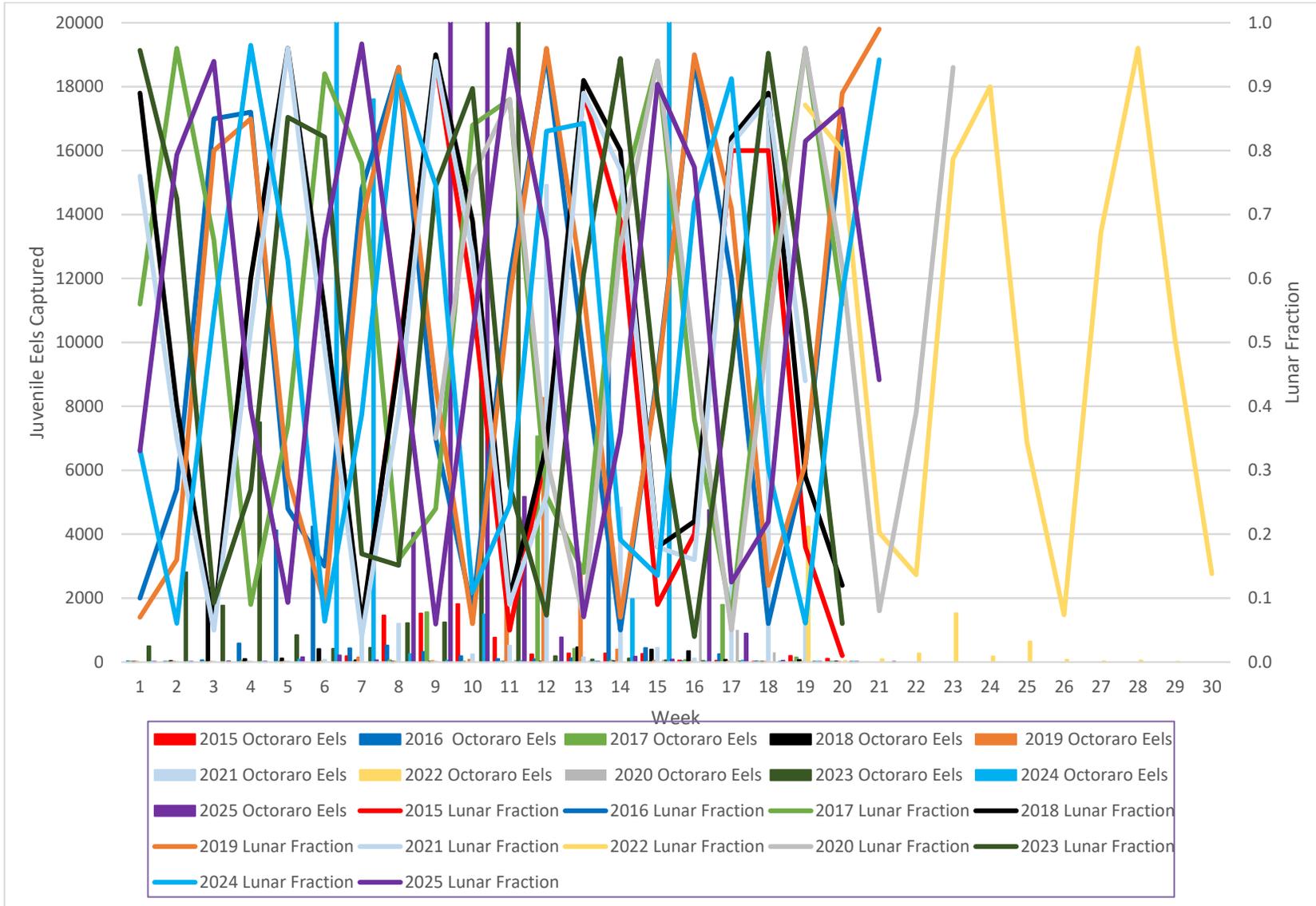
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2025 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
2025 Octoraro Eels	1	1	26	13	154	210	56	4044	32094	53326	5169	778	12	173	84	4756	895	45	2	1	5
2025 Creek flow (cfs)	74.4	89.6	126.5	100.8	250.5	248.8	88.6	110.4	193.5	484.0	568.1	206.7	137.6	245.6	128.6	290.0	114.4	77.8	75.1	80.5	58.5
2025 Lunar Fraction	0.330	0.793	0.940	0.397	0.093	0.663	0.967	0.532	0.059	0.512	0.958	0.660	0.071	0.358	0.904	0.774	0.125	0.220	0.815	0.865	0.442
2025 Water temp (°C)	17.8	18.8	18.7	17.8	18.1	20.7	21.2	24.0	25.0	25.1	25.8	25.8	26.3	24.5	24.3	24.2	22.3	21.7	21.7	21.7	21.8
Dissolved Oxygen (mg/L)	8.7	8.0	8.4	7.9	8.6	8.5	6.8	6.9	7.8	8.2	10.0	10.4	9.1	7.4	8.2	7.6	9.7	6.7	8.4	8.9	9.1
Rainfall (inch)	0.00	1.70	1.75	1.10	3.75	0.00	0.00	2.15	2.00	2.20	2.70	0.60	0.30	3.50	0.00	4.10	0.50	0.00	0.90	1.45	0.00
Percent of Catch	< 0.01	< 0.01	0.03	0.01	0.15	0.21	0.05	3.97	31.51	52.36	5.08	0.76	0.01	0.17	0.08	4.67	0.88	0.04	< 0.01	< 0.01	< 0.01
Turbidity (NTU, weekly avg.)	5.80	4.53	1.32	0.91	5.33	2.44	2.00	2.10	38.14	58.80	52.58	5.17	4.56	12.37	4.92	17.97	3.07	1.96	3.97	2.16	0.65
Creek elevation (ft, weekly avg.)	0.375	0.317	0.227	0.329	-0.011	0.298	0.315	0.232	0.093	-0.402	-0.659	-0.125	0.105	-0.110	0.147	-0.034	0.112	0.319	0.270	0.257	0.374
Conowingo Eels	1734	37738	9122	7732	658	2972	12538	1453	24528	27667	39677	96769	44856	22569	5304	4295	11195	7636	565	1250	22

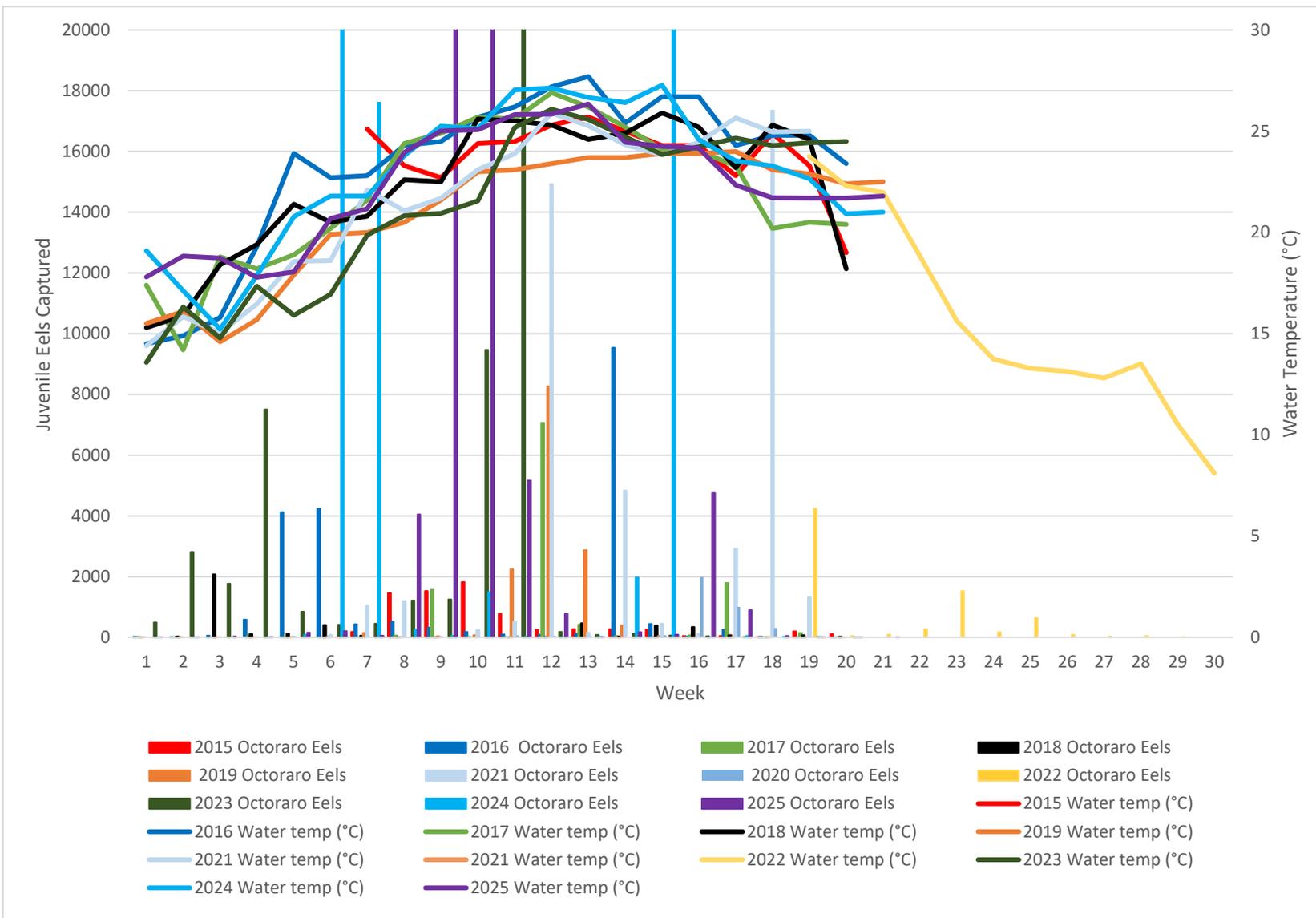
Eel Catch (Collection) to Creek Flow (2015-2025)



Eel Catch (Collection) to Lunar Fraction (2015-2025)



Eel Catch (Collection) to Water Temperature (2015-2025)



**Appendix C:
Agency Comments on Draft 2025 American Eel
Collection Facility in Octoraro Creek**

2025 Octoraro Creek Eel Facility Report (May 1 - September 15) Comments Received by Resource Agency and Date	
Resource Agency	Date of Receipt by Constellation
Susquehanna River Basin Commission	Friday, December 5, 2025
United States Fish and Wildlife Service	Thursday, December 4, 2025
Pennsylvania Fish and Boat Commission	Friday, December 5, 2025
Maryland Department of the Environment Maryland Department of Natural Resources	No Comments Received
Pennsylvania Department of Environmental Protection	Thursday, December 4, 2025

Responses to Resource Agency Comments for the Octoraro Creek Eel Facility Report, 2025

SRBC

No Comment

USFWS

Comment: The Service requests that you add a bit of text to the report to define the "eel ramp entrance" and whether that refers only to the aluminum conveyance channel or if it includes the substrate that extends from the conveyance channel into the stream bed.

Response: Additional sentence was added to section 3.1; 2nd paragraph on Page 5. The entrance of the ramp is defined as convergence of the aluminum conveyance channel and the shoreline substrate but does not include the connectivity of the attraction flow over the extended piece of substrate to the tailwater elevation.

Comment: We also note that it appears the dissolved oxygen monitoring served its purpose during the high catch event in 2025 - thank you for adding that technology to the collection facility this past year. It is also encouraging to see a good catch year at Octoraro in 2025.

Response: None needed

PFBC

No Comment

MDE/MDNR

No Comments Received

PADEP

Comment: The addition of the dissolved oxygen (DO) supplementation system appears to be working.

Response: None needed

Comment: PADEP appreciates Constellation's use of other water parameter monitoring devices at the facility.

Response: None needed

From: Henning, Aaron <ahenning@srbc.gov>
Sent: Friday, December 5, 2025 8:34 AM
Subject: [EXTERNAL]RE: Octoraro Creek Eel Facility 2025 draft report

Andrea,

The Susquehanna River Basin Commission has reviewed the 2025 Octoraro Creek Eel Facility Report and has no comments.

Aaron

Aaron Henning
Fisheries Biologist
Susquehanna River Basin Commission
4423 North Front St.
Harrisburg, PA 17110
ahenning@srbc.gov

From: Eyler, Sheila <sheila_eyler@fws.gov>
Sent: Thursday, December 4, 2025 9:51 AM

Subject: [EXTERNAL]Re: [EXTERNAL] Octoraro Creek Eel Facility 2025 draft report

Thanks for the opportunity to review and provide comments on the Octoraro Creek Eel Facility 2025 draft report.

The Service requests that you add a bit of text to the report to define the "eel ramp entrance" and whether that refers only to the aluminum conveyance channel or if it includes the substrate that extends from the conveyance channel into the stream bed.

We also note that it appears the dissolved oxygen monitoring served its purpose during the high catch event in 2025 - thank you for adding that technology to the collection facility this past year. It is also encouraging to see a good catch year at Octoraro in 2025.

Let me know if you have any questions.
Sheila Eyler
U.S. Fish and Wildlife Service
Mid-Atlantic Fish & Wildlife Conservation Office

From: Yamashita, Coja <cyamashita@pa.gov>
Sent: Friday, December 5, 2025 4:14 PM
Subject: RE: [External] Octoraro Creek Eel Facility 2025 draft report

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Andrea,

The PFBC has reviewed the Constellation 2025 Octoraro Creek Eel Facility draft report and has no comments.

Thank you for the opportunity to review the report.

Coja Yamashita | Chief
Pennsylvania Fish and Boat Commission | Division of Aquatic Species
Restoration
595 East Rolling Ridge Drive | Bellefonte PA 16823
fishandboat.com

From: Eberts, Ron <reberts@pa.gov>
Sent: Thursday, December 4, 2025 2:22 PM
Subject: [EXTERNAL]RE: [External] Octoraro Creek Eel Facility 2025 draft report

Andrea,

PADEP has reviewed the DRAFT Octoraro Creek Eel Facility 2025 Report received on November 7, 2025. PADEP has the following comments:

1. The addition of the dissolved oxygen (DO) supplementation system appears to be working.
2. PADEP appreciates Constellation's use of other water parameter monitoring devices at the facility.

Thank you for the opportunity to 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