Exelon Generation®

January 15, 2021

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Muddy Run Pumped Storage Project, FERC Project No. 2355, License Article 401 – 2020 American Eel Collection Facility in Octoraro Creek Report

Dear Secretary Bose,

Article 401(b) of the Muddy Run Pumped Storage Project (Project) license requires Exelon Generation Company, LLC (Exelon) to file various reports, required by the Pennsylvania Department of Environmental Protection's (PADEP) Water Quality Certification and the U.S. Department of the Interior's (DOI) fishway prescription, with the Federal Energy Regulatory Commission (Commission). In part, Article 401(b) requires Exelon to file an annual American Eel Collection Facility report, documenting the performance of an eel trapping facility on Octoraro Creek no later than January 15th each year.

Please note that the Octoraro Creek Eel Collection Facility operated from June 26, 2020 through October 3, 2020 instead of May 1, 2020 through September 15, 2020 due to COVID-19 state restrictions. The delayed start of the season and subsequent extension into October was approved by the Muddy Run Eel Passage Advisory Group.

The enclosed documentation provides the American Eel Collection Facility in Octoraro Creek. The report was previously distributed to the PADEP and the Resource Agencies to review and to solicit comments. Comments were received in December 2020 and are included in Appendix D of the attached report.

If you have any questions regarding the attached report, please feel free to contact me at (267) 533-1125 or via email at andrea.danucalov@exeloncorp.com.

Respectfully submitted,

Andrea Danucalov

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Muddy Run Pumped Storage Project American Eel Collection Facility in Octoraro Creek, 2020

FERC Project No. 2355

Prepared for:

Exelon.

Submitted On:
January 8, 2021

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Executive Summary

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

Pursuant to the FERC License and the Pennsylvania Department of Environmental Protection (PADEP) 401 WQC, Exelon 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 reports met the requirements of the PADEP 401 WQC and U.S. Department of the Interior fishway prescription for the Project. The eel facility continued to operate as a temporary facility in 2018, 2019 and 2020, but the location is now considered permanent. Exelon completed upgrades (larger submersible pump and waterline, manifold, collection tank, and attraction flow lines) to the Octoraro Creek eel facility prior to the 2019 season. Exelon received the new Chester Water Authority (CWA) signed agreement on December 2, 2019. The remaining work left to be completed was dependent upon receiving the signed agreement so that Exelon could apply for permits. The remaining work left to be completed addresses aesthetics, safety (stairs), and erosion, which is an emerging issue due to storm events during the fall of 2018 and early 2019. During each monthly EPAG call the remaining work has been communicated. The permanent facility will be completed upon permit acquisition and construction completion without interruption to the 2020 season. The completed upgrades made in 2019 were related to eel passage, and the remaining upgrades involve addressing safety aspects and erosion issues.

The 2020 season was delayed due to concerns to an underground buried tailrace structure below the existing eel collection scaffolding and the COVID-19 pandemic. The upgrades to the eel collection structure and the erosion control concerned CWA with the design drawing showing 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 due to the COVID-19 pandemic following the PA governor's mandate for essential workers. Due to the results of the underground survey, which confirmed a void under the current location of the eel facility, it was constructed at the top of the hill with agreement from the agencies. A single ramp containing Enkamat substrate was used in 2020 because Milieu substrate could not be obtained due to COVID-19 shipping issues from Canada. The Octoraro Creek Eel Facility was operated in 2020 following Exelon and Normandeau's COVID-19 protocols which followed all local, state, federal and CDC guidelines.

Each year, eels collected in Octoraro Creek are transported to and held at the Conowingo Eel Collection Facility (CECF) at Conowingo Dam and subsequently transported and released at designated points in the Susquehanna River watershed.

The report provides details on the following objectives for the 2020 field investigation:

- Install seasonal components of the eel collection facility on Octoraro Creek immediately downstream of Chester Water Authority's (CWA) Pine Grove Low-Head Dam;
- Document any modifications made to the facility during the course of the season to improve functionality and eel attraction capability.
- Operate, maintain, and monitor the eel collection facility (daily) from June 26 through October 3, 2020;
- Collect catch and length data, water quality, creek flow, and moon phase data during the entire sampling period;
- Transport eels collected by the facility to the CECF at Conowingo Dam;
- Conduct weekly quality control (QC) checks and cleaning of the eel collection facility to maintain proper attraction water flow;

Seasonal components of the Octoraro Creek Eel Facility included: longer juvenile eel ramp, a one horsepower submersible pump and waterline, manifold, 80 gallon collection tank, and one inch attraction flow lines. The seasonal components were installed and placed in service on June 26, 2020. Improvements to avoid the buried tailrace structure were also completed by June 26, 2020. The facility operated a total of 95 days from June 26 to October 3, 2020. The eel ramp was damaged due to high flows from Tropical Storm Isaias on August 4, 2020. The eel facility was out of service from August 4 through August 8, when the ramp was removed and repaired.

A total of 3,597 juvenile eels were collected at the Octoraro Creek Eel Facility. The greatest number of juvenile eels was collected on August 13, 2020 with 661 eels or 18.4% of the total season catch. A single peak occurred from August 12-16, accounting for 2,062 of the 3,597 (57.3%) juvenile eels collected at the facility. Daily juvenile eel collections numbering less than 10 individuals were recorded on 69 days (72.6%) of the 95 collection days. Volumetric estimates were not utilized during the 2020 season at the Octoraro Creek Eel Facility.

Length, weight, and injuries (condition factor) were recorded from biweekly subsamples on 194 juvenile eels. Length of juvenile eels ranged from 91-170 mm with an average length of 125.8 mm. The average weight of juvenile eels was 2.2 grams (g) and ranged from 0.8-6.3 g. Only 2 of the 194 (1.0%) showed any form of external injury (condition factor) such as bruising, scrape, or hemorrhage.

A total of 3,597 juvenile eels collected at the facility were transported within 24 hours of capture to the CECF at Conowingo Dam where they were held before transport. No eels died at the facility or during transport to Conowingo during the 2020 season (100% survival).

Cleaning and calibration of the facility was performed weekly. Cleaning of the collection tank, screened drains, and spray bars occurred daily after all eels were removed for transport. Scrubbing of the barrel that held the pump and the spray bars occurred prior to any calibration. The pump, manifold, and attraction lines were also cleaned as needed during the season. CWA operated the small hydroelectric facility on 23 days (24.2%) of the 95 sampling days.

List of Abbreviations

Agencies/Groups	
CWA	Chester Water Authority
CECF	Conowingo Eel Collection Facility
EPAG	Eel Passage Advisory Group
Exelon	Exelon Generation Company, LLC
FERC	Federal Energy Regulatory Commission
PADEP	Pennsylvania Department of Environmental Protection
plant	CWA water treatment plant
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
gpm	gallons per minute
in	inches
km	Kilometer
L	liter
mg/L	milligrams per liter
mm	millimeter
QC	quality control
Miscellaneous	
WQC	Water Quality Certification
YSI 550A	YSI Incorporated (water quality measuring device)

1 Introduction

Exelon Generation Company, LLC (Exelon) received a license from the Federal Energy Regulatory Commission (FERC) on December 22, 2015 for the Muddy Run Pumped Storage Project (Muddy Run Project). An American Eel, *Anguilla rostrata,* Passage Plan (Eel Plan) was developed by Exelon and included as a condition of the Pennsylvania 401 Water Quality Certification (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 Exelon 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 Pennsylvania Department of Environmental Protection (PADEP) and other members of the Eel Passage Advisory Group (EPAG)[1].

Eels collected in Octoraro Creek were transported directly to and held at the Conowingo Eel Collection Facility (CECF) at Conowingo Dam and subsequently transported and released at designated points in the Susquehanna River watershed.

The report provides details relative to the following objectives for the 2020 field investigation:

- Installation of seasonal components to the eel collection facility on Octoraro Creek immediately downstream of Chester Water Authority's (CWA) Pine Grove Low-Head Dam;
- Document any modifications made to the facility during the course of the season to improve functionality and eel attraction capability.
- Operate, maintain, and monitor the eel collection facility (daily) from May 1 through September 15, 2019;
- Collect catch and length data, water quality, creek flow, and moon phase data during the entire sampling period;
- Transport eels collected by the facility to the CECF at Conowingo Dam;
- Conduct weekly quality control (QC) checks and cleaning of the eel collection facility to maintain proper attraction water flow;

Seasonal components of the Octoraro Creek Eel Facility included: new longer juvenile eel ramp, a one horsepower submersible pump and waterline, two inch manifold, 80 gallon collection tank, and one inch attraction flow lines. The seasonal components were installed and placed in service prior to the 2020 eel collection season.

[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 Exelon.

2 Background

Areas of lower Octoraro Creek up to and including 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). Exelon 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 is located immediately downstream of the Art Building (Figure 2.0-2).

Recent trapping efforts by the United State Fish and Wildlife Service (USFWS, Minkkinen and Park 2014 and personal communication with USFWS, Christopher Reily, October 27, 2016) on the west shore of the Susquehanna River below Conowingo Dam have shown that the bulk of the juvenile eel migration occurs from May into September with most eels collected in June and July (Figure 2.0-3).

The temporary eel trapping facility adjacent to CWA's small hydroelectric site on Octoraro Creek was 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 reports met the requirements of the PADEP 401 Water Quality Certification (WQC) and U.S. Department of the Interior fishway prescription for the Project. The eel facility has operated as a permanent facility since 2018.

Prior to the 2019 eel season, Exelon completed upgrades to the Octoraro Creek Eel Facility related to eel passage (larger submersible pump and waterline, manifold, collection tank, and attraction flow lines). Work related to facility aesthetics and safety (stairs) and erosion remains to be completed. This remaining work requires a PADEP Chapter 105 Wetland and Waterway Obstruction and Encroachment Permit and, therefore, a signed agreement from CWA (the landowner) was necessary so that Exelon could apply for this permit. Exelon 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 PADEP Chapter 105 Wetland and Waterway Obstruction and Encroachment Permit application package was deemed complete by PADEP and the permitting public comment period closed on March 2, 2020. Exelon received a permit on May 8, 2020. Meanwhile, in March 2020, CWA reviewed the facility project plans again and had concerns with the proposed upgraded eel structure plans along the left bank of Conowingo Creek due to an abandoned underground buried tailrace that runs below the proposed gazebo platform. The existing facility was revised and improvement plans were reconsidered for safety and constructability. Exelon planned on having an underground survey crew perform studies to identify the exact location of this structure and if it created a void. Prior to having this survey performed, the Governor of Pennsylvania, Tom Wolf, ordered only certain life-sustaining business to remain open to slow or decrease the spread of the novel Corona Virus (COVID-19), starting on March 19, 2020 (Appendix A). On March 20, 2020, Exelon received a message from CWA stating that according to the governor's memo concerning all non-life sustaining business, including construction, halt operations immediately. The underground survey was

postponed until the governor lifted this order. In early May, the Governor amended the construction cease and desist proclamation of the COVID-19 order, at which time the underground survey was scheduled and completed in mid-May. The results to the survey was distributed prior to a conference call with the Resource Agencies on June 2, 2020 (Appendix A). During this conference call, alternative options for the eel facility were discussed, and a decision, made by all parties to construct a longer ramp with the collection tank and scaffolding placed at the top of the hill near the driveway was agreed upon.

The Octoraro Creek Eel Facility began operations on June 26, 2020. The season was extended to October 3, 2020 to compensate for delayed start of the season. The Octoraro Creek Eel Facility was operated in 2020 following Exelon and Normandeau's COVID-19 protocols which followed local, state, federal and CDC guidelines.

A single cable tray of Enkamat substrate was used in 2020, due to the inability to obtain the Milieu substrate due to COVID-19 shipping issues from Canada.

3 Methods

3.1 Design, Construction, and Installation of Facility

In 2020, modifications were made to the existing eel facility to safety operate the facility with the underground buried tailrace void underneath. (Appendix A) These modifications included: a collection tank platform at the top of the hill, a single Enkamat substrate juvenile eel ramp, a longer waterline with an increase head, and longer attraction water flow lines.

A scaffolding was added to the top of the hill in line with the previous year's scaffolding. The size of the scaffolding platform was identical to the other platform utilized in previous seasons (Figure 3.1-1). The collection tank, manifold, and aeration system remained the same as the previous year (Normandeau Associates and Gomez and Sullivan 2020). The scaffolding was moved to the top of the hill to address safety concerns due to the presence of a buried tailrace structure creating a void under the previous year's scaffolding. In addition, a rainfall gauge was installed on the corner of the scaffolding to capture and record daily rainfall events (Figure 3.1-2).

The longer juvenile eel ramp was constructed and installed with the identical entrance location to the previous ramps (Figure 3.1-1). The ramp consisted of approximately 12.3 meter (m) x 305 millimeter (mm) wide cable trays positioned at a 30° angle, plus a continuous length of tray that was bent and shaped at a 90° angle over a 25 mm radius at the top of the ramp to convey juvenile eels into the collection tank. The entrance of the ramp was underwater during all flow conditions, which allowed for a smooth transition from the existing riverbed adjacent to a quiescent pool located in the creek. The ramp was supported by the previous scaffolding and held in place by four T-shaped solid metal braces, evenly spread across the length of the ramp, and driven into the ground beneath the ramp (Figure 3.1-3). On either side of these braces, a hole was drilled into the flat bar and a bungee cord was used to fasten the ramp to these braces. The ramp was covered from the top down to near the tail water median flow height to protect juvenile eels when ascending. A hinged cover was added to the new ramp over the spray bar to decrease light inside the ramp at the top of the ramp.

The 51 mm water line exited the hillside at the previous year's collection level, so an additional length of 51 mm water line was extended back to the top of the hill where the 2020 collection tank was located (Figure 3.1-4). The 51 mm water line was attached to a 51 mm manifold with seven 25 mm ball valves that supplied water to the spray bars and additional attraction flow lines.

The collection tank is 660 mm wide with a length of 1,575 mm. The depth of the water in the collection tank is about 299 mm, with a volume of approximately 310.4 Liters (L). Like prior years, the collection tank was filled by allowing some of the spray bar flow to enter the collection tank, thus providing a constant flow of freshwater. The collection tank contained two drains comprised of a 76 mm PVC pipe with holes drilled through it and wrapped in one mm mesh to prevent juvenile eel escapement. One collection tank drain line was directed to the highest point possible (gravity feed) of the ramp, thus providing eel scent from the eels in the collection tank to the ramp. The other drain line was capped off in 2020 due to only one ramp being utilized this year. The collection tank was custom fitted with a lid that was held down by clamps. The air stones from an aerator were added to the collection tank to supply additional aeration throughout the 2020 season. The aerator

was connected to a deep cycle marine battery connected to a portable solar panel and a trickle charger.

3.2 Data Collection

Sample data including date, time of sample, weather, eel counts, water temperature, dissolved oxygen, and rainfall were recorded daily. 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 flow and lunar fraction were also recorded, verified, and entered into an electronic format. All Eel count data was actual counts in 2020.

Length and weight measurements, along with condition factor were recorded biweekly from a maximum of 25 individuals (when available). Eels were measured and weighed after being anesthetized (Figures 3.2-1 and 3.2-2).

Water temperature and dissolved oxygen (DO) were measured in the collection tank, and also in the head pond near the pump during each sampling event, with an YSI© 550A water quality meter that was calibrated prior to each sampling event.

3.3 Juvenile Eel Transport

All juvenile eels captured in the Octoraro Creek Eel Facility were transported to the CECF at Conowingo Dam where they were held before subsequent transport and release at designated locations in the Susquehanna River watershed.

When less than 150 eels were collected during a sampling event, the eels were transported in aerated 19 L buckets with lids that contained the maximum amount of water to prevent sloshing, with ≤ 50 eels in each bucket. When counts of juvenile eels were greater than 150 individuals, a small enclosed transport tank (250 L) that was filled completely to prevent sloshing and equipped with supplemental oxygen to maintain DO levels in the tank, was used (Figure 3.3-1).

4 Results

The Octoraro Creek Eel Facility commenced operation on June 26 and shut down operation on October 3, 2020[2]. This facility was delayed in starting operation in 2020 due to an underground tailrace void below the scaffolding and the COVID-19 pandemic. No eel collection occurred during Weeks 1-8, and collections started on June 27, 2020. The facility was checked daily during the 95 day season, to ensure that the facility was attracting eels. The facility was out of service from August 4 to August 8 due to damage to the ramp from Tropic Storm Isaias. A total of 3,597 juvenile eels were collected during the 2020 season (Table 4.0-1). Daily checks were conducted as a condition of the facility's permanent status.

4.1 Juvenile Eel Collection

A total of 3,597 juvenile American Eels were captured at the Octoraro Creek Eel Facility during the 2020 season. Individual counts were recorded daily (Table 4.0-1). The highest one-day total of 661 juvenile eels occurred on August 13, accounting for 18.4% of the season total (Table 4.0-1 and Figure 4.1-1). No single day monitoring checks recorded juvenile eel numbers > 1,000 individuals during the 2020 season (Table 4.0-1).

4.2 Juvenile Eel Biological Data

Biological data (length, weight and condition factor) was recorded from biweekly subsamples. A total of 194 juvenile eels was collected from these biweekly subsamples (5.4% of total eels collected), during 21 of the 95 sample days (Table 4.2-1).

The average length of juvenile eels was 125.8 mm, with a median size of 125.0 mm (Table 4.2-1). The length of juvenile eels ranged from 91 - 170 mm, with only five juvenile eels measuring less than 100 mm. During the 2020 season, no eels measured greater than 175 mm (Table 4.2-2). Over 85% of the 194 measured eels ranged between 100-145 mm.

The average weight of juvenile eels was 2.2 grams (g), with a median weight of 2.0 g (Table 4.2-1). The weight of juvenile eels ranged from 0.8 – 6.3 g (Table 4.2-3). Over 95% of the 194 juvenile eels weighed between 1.0 – 4.5 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 1.0%, (2 of 194 individuals) of the examined eels. Injuries were observed on August 17 and 27, 2020, were coded as a minor hemorrhage to the caudal tail and scrapes on body, respectively (Figures 4.2-1 and 4.2-2).

[2] On an April 16, 2020 teleconference, Exelon informed EPAG that 2020 seasonal set-up was delayed. EPAG was notified via email that the Octoraro Creek Eel Collection Facility had started seasonal operations on June 27, 2020. On an August 20, 2020 teleconference, Exelon consulted EPAG regarding continuing seasonal operation through October 3, 2020; EPAG approved extended the collection season. On a September 17, 2020 teleconference, Exelon confirmed that it planned to continue operation of the Conowingo Eel Collection Facility through October 3, 2020. EPAG was also notified via email on August 5 that operations had been interrupted on August 4 and were notified via email on August 8 that repairs had been completed and the facility was again operational.

4.3 Juvenile Eel Collection by Week

The majority of the juvenile eels were collected during Week 16 (August 9-15) when the facility collected 55.4% (1,992 individuals) of the season total. Weeks 17 and 18 collected the second and third greatest number of eels at 27.9% (1,005 eels) and 8.5% (306 eels) of the season total, respectively (Table 4.3-1 and Figure 4.3-1). During Weeks 16-18, the Octoraro Creek Eel Facility collected 91.8% (3,303 of the 3,597 juvenile eels) of the season catch.

Weeks 11-13 and 15 collected between 1.1 - 2.0% (40-71 eels) of the season total (Table 4.3-1 and Figure 4.3-1). Week 9 (first week of the 2020 season) collected 0 eels. Weeks 10, 14, and 19-23 of sampling collected no greater than 1.0% of the season total, accounting for 75 individuals (2.1%) combined. Weekly catch data are also provided in Appendix B.

4.4 Peak Period of Eel Collections

During the season, there was one peak period that produced seasonally high numbers of juvenile eels. This peak (August 12-16, 5 days) yielded 2,062 of the 3,597 juvenile eels or 57.3% of the total season catch (Table 4.0-1 and Figure 4.1-1).

4.5 Juvenile Eel Catch in Relation to Environmental Factors

See Appendix C for weekly averages of juvenile eel capture, river flow, lunar fraction, water temperature, and DO.

Creek Flow

Creek flow and juvenile eel catch appeared to be related during the 2020 season. Daily average creek flow was taken from the United States Geological Survey (USGS) 01578475 Octoraro Creek near Richardsmere, MD gage, located approximately 21 kilometers (km) downstream of CWA's Pine Grove Low-Head Dam (Table 4.5-1). The highest daily average creek flow value per the USGS gage station occurred on August 4, 2020 (3,920 cubic feet per second, cfs, Table 4.5-1). The three highest daily values occurred during Week 15 of eel facility operation, and occurred just before the peak period of eel catch (Tables 4.0-1 and 4.5-1).

Week 16 had the second highest average weekly flows (251 cfs), but the greatest amount of eel were collected this week (Figure 4.5-1 and Appendix C). An increase of creek flow typically corresponds to increases in juvenile eel collection for this time period, but higher catch numbers during periods without an increase of flow may be a function of other variables (e.g., migration timing).

Lunar Fraction

Juvenile eel catch did not appear to be correlated to lunar fraction (cycle) during the 2020 season. The largest peak in eel capture (2,062 eels collected from August 12-16) occurred during the week after the second brightest week of the season (Table 4.5-2, Figure 4.5-2 and Appendix C, U.S Naval Observatory website 2019). Full moon is equal to 1.0 lunar fraction.

Weeks 17, 13, and 21 were ranked first, second, and third darkest weeks. Although during Week 17, 1,005 eels were captured, only 40 and 5 eels were captured on Weeks 13 and 21, respectively (Appendix C). 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 related this season. Water temperatures were above 20.0° Celsius (C) when the facility started on June 26, 2020. Over the course of the season, the water temperature ranged from a high of 25.8°C on August 2 (Week 15) to a low of 17.5°C on October 3 (Week 23, Table 4.5-3 and Figure 4.5-3). A small decrease in water temperature occurred during Week 16 with an increase in eel capture, and a decrease in water temperature was observed during Week 22 but did not show an increase in eel capture.

Dissolved Oxygen

Eel collection numbers and DO did not appear to be related this season. DO is recorded as milligrams/Liter (mg/L). The data indicated that the water above the dam did stratified and the readings were lower than those observed in the collection tanks for most of the season (Table 4.5-4 and Figure 4.5-4). The aeration system was operated all season; a daily DO readings is presented in Table 4.5-4 and displayed in Figure 4.5-4. Measurements of DO were usually taken in the morning when the lowest DO would be more likely to be observed.

Rainfall

Juvenile eel collection and rainfall did not appear to be related during the 2020 season. Rainfall was recorded typically in tenth of inch (in) by a rain gauge affixed to the scaffolding platform. The largest amount of rain fall was recorded on July 7, 2020 with 2.1 inches (Table 4.5-5 and Figure 4.5-5). However, on August 4, 2020, Tropical storm Isaias traveled across southern Pennsylvania dropping large amounts of rain over the Octoraro Creek watershed. The morning of August 4, 2020, the eel facility was checked and the observed rainfall amount was 1.75 inches (Table 4.5-5 and Figure 4.5-5). Rainfall was not measured from August 5 through August 8, 2020 when the ramp was out of service due to damage from the high flows from Tropical Storm Isaias. Recorded rainfall amounts over 1.0 inch were observed on three days during the 2020 season: July 11, August 25, and September 30. On 73.7% of the season (70 of the 95 days), the rain gauge recorded valves of 0.0 inches.

4.6 Juvenile Eel Transport and Mortality

See Table 4.6-1 for detailed information of transport and mortality data.

Transport

Juvenile eels collected at the Octoraro Creek Eel Facility were transported within 24 hours of capture. Transport time from Octoraro Creek Eel Facility to the CECF at Conowingo Dam was about 30 minutes. No juvenile eel mortalities were observed when transferring eels from the transport vehicle into the Conowingo holding facility.

Mortality

Of the 3,597 juvenile eels that were captured at this facility, no eels were found dead in the collection tank (100% survival). All juvenile eels 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. Attraction flow lines, pump, barrel, and the manifold were cleaned as needed during the season.

Calibration of the ramp flow was executed each week after cleaning, using a 4-gallon graduated bucket. Three different locations of the ramp were checked for calibration purposes - the spray bar, the collection tank drain, and the additional attraction flows at the entrance of the ramp. The attraction flow at the top of the ramp (top attraction flow) was calculated by subtracting the spray bar amount from the drain of the collection tank. Details and calibration records are listed in Table 4.7-1.

The amount of algae growth within the hoses and spray bar increased throughout the season. In an effort to increase the flow of attraction water to the ramps, the pump, the barrel, manifold, and all the attraction flow lines were scrubbed or snaked clean weekly, except the first week, during the 2020 season (Table 4.7-1). The same submersible pump was used all season.

4.8 Other Species Caught

Two other aquatic species were caught in addition to American Eel. Two River Crayfish (Cambaridae family) were netted from the collection tank on two occasions during the season. A Stinkpot Turtle (*Sternotherus odoratus*) was also removed from the collection tank on July 14, 2020.

5 Discussion

The CECF at Conowingo Dam, and the Octoraro Creek Eel Facility had only one Enkamat ramp during the 2020 season. Conowingo's facility operated from May 18 through October 3 while the Octoraro facility was delayed and operated from June 26 through October 3. The Conowingo facility captured 254,651 eels compared to the Octoraro Creek Eel Facility which captured 3,597 juvenile eels during the 2020 season. With both ramps operating simultaneously, the Octoraro Creek facility captured 1.4% of the number of eels collected by the CECF at Conowingo Dam. During this time, the size range of the juvenile eels caught at the CECF at Conowingo Dam facility was 71-186 mm with an average length of 112.2 mm (Normandeau Associates, Inc. 2020). The size of the juvenile eels caught in the ramp at the Octoraro Creek Eel Facility were between 91-170 mm and an average length of 125.8 mm. Overall, the ramp at the CECF collected a wider size range of eels and much smaller eels. No eels died in the collection tank or during transport from the Octoraro Creek Eel Facility to the CECF.

The attraction flow to the ramp during the 2020 season was decreased from last year due to the increase in head from the old scaffolding to the uphill scaffolding. The upgrades installed prior to the start of the 2019 season increased the attraction flows to greater than 56.3 gpm and even as high as 74.5 gpm compared to the 44.2 – -56.1 gpm of total attraction flow in 2020 (Table 4.7-1). The collection tank was cleaned, hoses inspected, and spray bars checked and cleaned during each sample to ensure flow. Due to the algae build up inside the hoses, a routine (weekly) or as needed clean-out of the hoses and manifolds used was performed to maintain a more consistent attraction flow. The range of attraction flows could be from the head difference when flows decrease or from the build-up of biological growth in the system. The hardiness of this species and its ability to adjust to parameters were evidenced by the numbers captured here.

The scaffolding, collection tanks, and hoses are not shaded at this time.

Water temperature and DO readings were taken daily in the head pond at the pump level and in the collection tank. The data indicated that the water above the dam did stratify and the readings were lower than those observed in the collection tank for most of the season (Table 4.5-4 and Figure 4.5-4). The aeration system was operated all season.

The average creek flow value per the USGS gage station during the 2020 season was similar to the previous years of operation (2015-present) during the operational period. The average creek flow value during the operational period of May 1 through September 15, 2015-2019 was 218.2 cfs compared to the average creek flow value of 224 cfs in 2020 (Table 5.0-1 and Normandeau Associates and Gomez and Sullivan 2015, 2016, and 2018a and Normandeau Associates 2018a and 2019a). In 2020, daily average creek flow exceeded 1,000 cfs on two days, and the daily average creek flow was below 100 cfs for 18 days compared to 24, 65, 46, 4, and 13 days in 2015, 2016, 2017, 2018, and 2019, respectively. CWA operated its hydro facility on 23 of the 95 days (24.2%) this year, but we observed no relationship between eel catch and hydro operation (Table 4.0-1). The cobble/gravel outcrop that was formed just downstream of the entrance to the eel ramps in 2018, did not change much after then major creek flow in early August (Figure 5.0-1). The outcrop did not change the location of the ramp's entrance, which remained underwater throughout the entire 2020 season, just as in previous years.

Since 2015, 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 flow in August 2020. Figure 5.0-2 shows a comparison of 2015 through 2020 weekly catch and average creek flow data. In 2016, 2017, and 2018, the high flow events co-occurred with a new moon phase, unlike the 2019 season high flow events, which occurred during a full moon phase. The high flow event and the full moon phase again occurred at the same time during the 2020 season, but the peak eel collection occurred the following week. See Appendix C for additional weekly data comparing 2015 through 2020.

The number of eels collected (3,597 individuals) in 2020 was the lowest total in the past six years, but 2020 season was delayed by the pandemic and the underground buried tailrace void issue and was shorter than other years (Table 5.0-1). The lowest collection of eels, in one season, occurred in 2018 when the average number of eel collected daily was 31.1 eels compared to 37.9 eels in 2020. The average size of eels, 125.8 mm, captured in 2020 was smaller than any other year but only having the Enkamat substrate ramp could be a potential factor (Table 5.0-1). From 2015 to 2018, juvenile eels were measured during every sample day (up to 25 eels if available), but biweekly subsamples of lengths were collected in 2019 and 2020. The Octoraro Creek eel ramp has caught juvenile eels less than or equal to 100 mm every year. The size range of eels collected and measured in 2020 was smaller and could be a factor of not having the Milieu ramp installed.

After starting the 2020 season on June 26, 2020, the Octoraro Creek Eel Facility was interrupted for a few days due to damage to the ramp because of high creek flows. The ramp was damaged on August 4, 2020 by the effects of Tropical Storm Isaias, and was removed on August 5th for repairs (Figures 5.0-3 and 5.0-4). The repairs were made on August 6, and it was reinstalled on August 8 and the attraction flow was restarted. Eels (63 individuals) were removed on August 4, 2020 in the afternoon prior to the water being turned off and transported and stocked at Columbia (Site 3B). A power event occurred on September 10, 2020. Normandeau arrived at the facility in the morning to find the circuit had tripped and the pump did not automatically restart. This was rectified, and no other electrical issues where observed for the rest of the season. No mortality was observed due to the above events in 2020.

6 References

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7 Tables and Figures

Table 4.0-1: Number of Juvenile Eel Caught Daily, Octoraro Creek Eel Facility, 2020

Date	Number of Eels	Date	Number of Eels	Date	Number of Eels
6/27/2020*	0	7/30/2020	2	9/1/2020	4
6/28/2020*	0	7/31/2020	1	9/2/2020	0
6/29/2020*	1	8/1/2020	4	9/3/2020	2
6/30/2020*	2	8/2/2020	1	9/4/2020	2
7/1/2020*	6	8/3/2020	1	9/5/2020	1
7/2/2020*	0	8/4/2020	69	9/6/2020	1
7/3/2020*	4	8/5/2020	-	9/7/2020	0
7/4/2020*	2	8/6/2020	-	9/8/2020	0
7/5/2020*	1	8/7/2020	-	9/9/2020	1
7/6/2020*	3	8/8/2020	-	9/10/2020	0
7/7/2020*	5	8/9/2020	14	9/11/2020	0
7/8/2020*	28	8/10/2020	39	9/12/2020	3
7/9/2020*	12	8/11/2020	167	9/13/2020	0
7/10/2020*	7	8/12/2020	**606**	9/14/2020	0
7/11/2020*	8	8/13/2020	**661**	9/15/2020	3
7/12/2020*	13	8/14/2020	241	9/16/2020	0
7/13/2020*	5	8/15/2020	264	9/17/2020	1
7/14/2020*	1	8/16/2020	290	9/18/2020	1
7/15/2020	8	8/17/2020	160	9/19/2020	0
7/16/2020	7	8/18/2020	168	9/20/2020	0
7/17/2020	4	8/19/2020	100	9/21/2020	1
7/18/2020	6	8/20/2020	104	9/22/2020	1
7/19/2020	3	8/21/2020	127	9/23/2020	0
7/20/2020	5	8/22/2020	56	9/24/2020	0
7/21/2020	5	8/23/2020	23	9/25/2020	0
7/22/2020*	7	8/24/2020	98	9/26/2020	0
7/23/2020*	4	8/25/2020	64	9/27/2020	0
7/24/2020*	15	8/26/2020	37	9/28/2020	0
7/25/2020*	1	8/27/2020	59	9/29/2020	0
7/26/2020*	6	8/28/2020	16	9/30/2020	1
7/27/2020	2	8/29/2020	9	10/1/2020	4
7/28/2020	4	8/30/2020	12	10/2/2020	0
7/29/2020	1	8/31/2020	1	10/3/2020	1

*Days the hydroelectric facility was operating (23 days)
Bolded numbers are peak days
The peak period is shown in the box
Ramp was out of service August 4-8
8/4/20 – 69 eels collected, 6 transported to Conowingo and 63 transported to Columbia (Site 3B)

Table 4.2-1: Number of Juvenile Eel Captured with Length and Weight Measurements, Octoraro Creek Eel Facility, 2020

	Total
Number eels collected	3,597
Number measured	194
Data Collection Days	21
Range on lengths (mm)	91-170
Average length (mm)	125.8
Median length (mm)	125.0
Range on weights (g)	0.8-6.3
Average weight (g)	2.2
Median weight (g)	2.0

Table 4.2-2: Juvenile Eel Length Frequency, Octoraro Creek Eel Facility, 2020

TL (mm)	Number
90-94	2
95-99	3
100-104	12
105-109	11
110-114	26
115-119	20
120-124	22
125-129	19
130-134	21
135-139	20
140-144	15
145-149	7
150-154	9
155-159	3
160-164	1
165-169	2
170-174	1
Total	**194**

Table 4.2-3: Juvenile Eel Weight Frequency, Octoraro Creek Eel Facility, 2020

Weight (g)	Number
0.5-0.9	4
1.0-1.4	50
1.5-1.9	39
2.0-2.4	42
2.5-2.9	23
3.0-3.4	16
3.5-3.9	8
4.0-4.4	8
4.5-4.9	2
5.1-5.4	0
5.5-5.9	1
6.0-6.4	1
Total	**194**

Table 4.2-4: Observed Injuries of Juvenile American Eels, Octoraro Creek Eel Facility, 2020

Date	Length (mm)	Weight (grams)	Condition Factor
8/17/2020	168	5.5	Slight Hemorrhage Caudal Tail
8/27/2020	125	1.0	Scrapes on body

2 of 194 eels (1.0%) that were processed had injury

Table 4.3-1: Juvenile Eel Collection by Week and Ranks, Octoraro Creek Eel Facility, 2020

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Total									0	15	64	44
Rank									15	10	5	6
Percent Catch (%)									0.0	0.4	1.8	1.2
	Wk 13	**Wk 14**	**Wk 15**	**Wk 16**	**Wk 17**	**Wk 18**	**Wk 19**	**Wk 20**	**Wk 21**	**Wk 22**	**Wk 23**	
Total	40	20	71	1992	1005	306	22	5	5	2	6	
Rank	7	9	4	1	2	3	8	12	12	14	11	
Percent Catch (%)	1.1	0.6	2.0	55.4	27.9	8.5	0.6	0.1	0.1	0.1	0.2	

Top 3 ranked weeks are shown in boxes.
No collection occurred June 27, 2020 (Week 9)

Wk 1: May 1 - May 2
Wk 2: May 3 – May 9
Wk 3: May 10 - May 16
Wk 4: May 17 - May 23
Wk 5: May 24 – May 30
Wk 6: May 31 - June 6
Wk 7: June 7 - June 13
Wk 8: June 14 - June 20
Wk 9: June 21 - June 22
Wk 10: June 23 - July 4
Wk 11: July 5 – July 11
Wk 12: July 12 – July 18
Wk 13: July 19 - July 25
Wk 14: July 26 – August 1
Wk 15: August 2 – August 8
Wk 16: August 9 – August 15
Wk 17: August 16 - August 22
Wk 18: August 23 - August 29
Wk 19: August 30 – September 5
Wk 20: September 6 – September 12
Wk 21: September 13 - September 19
Wk 22: September 20 - September 26
WK 23: September 27 – October 3

Table 4.5-1: USGS 01578475 - Octoraro Creek at Richardsmere, MD Gage Flows Daily Average Creek Flows (cfs), 2020

Day	June	July	August	September	October
1		94.4	66.4	133	147
2		116	63.5	138	116
3		130	188	232	117
4		136	**3920**	176	
5		135	823	162	
6		207	252	161	
7		454	353	156	
8		234	**1530**	136	
9		227	279	80.0	
10		227	260	87.7	
11		225	243	97.1	
12		185	238	108	
13		182	279	118	
14		168	265	130	
15		82.3	192	163	
16		72.7	179	175	
17		73.0	170	170	
18		72.3	146	163	
19		70.8	326	131	
20		81.0	262	128	
21		92.7	110	127	
22		148	75.6	123	
23		137	115	108	
24		188	550	106	
25		152	309	107	
26		165	203	123	
27	146	135	138	113	
28	143	68.9	150	113	
29	142	65.6	183	118	
30	135	64.3	178	591	
31		66.4	139		

Bolded value represent the average river flows over 1,000 cfs

Table 4.5-2: Fraction of Moon Illumination, 2020 EST *(1.0 Equals Full Moon)*

Day	June	July	August	September	October
1		0.79	0.92	0.98	0.99
2		0.88	0.97	1.00	1.00
3		0.94	0.99	0.99	0.99
4		0.98	1.00	0.97	
5		1.00	0.98	0.93	
6		0.99	0.94	0.87	
7		0.96	0.89	0.80	
8		0.91	0.82	0.72	
9		0.85	0.75	0.63	
10		0.77	0.66	0.54	
11		0.69	0.57	0.44	
12		0.59	0.47	0.34	
13		0.50	0.38	0.25	
14		0.40	0.28	0.16	
15		0.31	0.20	0.09	
16		0.23	0.12	0.03	
17		0.15	0.06	0.01	
18		0.08	0.02	0.01	
19		0.04	0.00	0.04	
20		0.01	0.01	0.10	
21		0.00	0.05	0.18	
22		0.02	0.12	0.28	
23		0.07	0.20	0.38	
24		0.14	0.31	0.49	
25		0.22	0.42	0.60	
26		0.33	0.53	0.70	
27	0.35	0.44	0.64	0.79	
28	0.46	0.56	0.74	0.86	
29	0.58	0.67	0.83	0.92	
30	0.69	0.77	0.90	0.97	
31		0.85	0.95		

Table 4.5-3: Water Temperature (˚C) from the Collection Tank, Octoraro Creek Eel Facility, 2020

Day	June	July	August	September	October
1		21.2	24.9	23.7	18.3
2		21.2	25.8	23.3	18.6
3		21.6	25.5	23.7	17.5
4		22.1	25.2	23.5	
5		22.4		23.2	
6		22.6		22.8	
7		22.4		22.6	
8		22.9		23.5	
9		22.9	22.0	23.7	
10		23.1	22.3	**24.4**	
11		22.5	22.6	23.7	
12		22.0	22.5	23.4	
13		22.3	22.6	22.7	
14		22.4	22.8	23.4	
15		22.6	22.6	21.8	
16		23.1	22.9	21.6	
17		23.2	22.5	21.5	
18		23.2	22.6	21.1	
19		*23.3*	23.1	20.0	
20		24.1	22.7	19.2	
21		23.0	22.5	18.4	
22		24.1	23.3	18.1	
23		24.0	23.5	19.4	
24		23.9	23.6	18.5	
25		24.1	23.6	18.3	
26		24.5	23.3	18.5	
27	20.7	24.5	23.3	19.0	
28	21.2	25.0	23.4	19.1	
29	21.2	24.6	24.2	19.7	
30	21.2	24.7	23.6	19.2	
31		25.2	23.2		

Bolded value represents no flow to the facility, reset GFIC which restarted pump

Table 4.5-4: Water Quality Parameters at Associated Locations at Octoraro Creek Eel Facility, 2020

Day	Time	Collection		Head Pond	
		Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
6/27/2020	745	20.7	7.23	20.8	3.45
6/28/2020	954	21.2	7.33	21.2	4.00
6/29/2020	746	21.2	6.80	21.3	3.04
6/30/2020	700	21.2	4.88	21.4	2.98
7/1/2020	830	21.2	5.66	21.2	3.54
7/2/2020	730	21.2	6.40	21.2	3.60
7/3/2020	753	21.6	5.56	21.6	2.89
7/4/2020	734	22.1	5.65	22.1	2.88
7/5/2020	730	22.4	6.30	22.1	3.33
7/6/2020	826	22.6	5.97	22.3	3.56
7/7/2020	740	22.4	7.87	21.6	7.38
7/8/2020	742	22.9	5.55	22.9	3.08
7/9/2020	741	22.9	5.21	22.8	2.65
7/10/2020	745	23.1	5.40	22.9	2.95
7/11/2020	730	22.5	5.71	23.1	3.35
7/12/2020	700	22.0	5.51	22.2	2.50
7/13/2020	745	22.3	5.35	22.4	3.02
7/14/2020	800	22.4	5.16	22.6	2.76
7/15/2020	805	22.6	5.10	22.7	2.71
7/16/2020	800	23.1	5.61	23.2	3.59
7/17/2020	745	23.2	5.50	23.2	3.80
7/18/2020	850	23.2	5.92	23.3	3.35
7/19/2020	858	23.3	5.67	23.5	3.09
7/20/2020	730	24.1	5.61	23.7	3.10
7/21/2020	940	23.0	7.44	23.8	5.09
7/22/2020	810	24.1	5.38	24.0	3.00
7/23/2020	725	24.0	5.40	24.1	3.40
7/24/2020	754	23.9	5.43	24.0	3.94
7/25/2020	730	24.1	6.40	24.1	2.80
7/26/2020	645	24.5	5.24	24.4	2.74
7/27/2020	733	24.5	4.70	24.5	2.50
7/28/2020	800	25.0	5.01	24.9	2.93
7/29/2020	750	24.6	5.60	24.8	2.80
7/30/2020	724	24.7	5.30	24.9	2.60
7/31/2020	750	25.2	5.61	25.2	2.61
8/1/2020	745	24.9	5.40	24.9	2.80
8/2/2020	920	25.8	5.33	25.6	2.56
8/3/2020	731	25.5	5.80	25.5	3.70
8/4/2020	800	25.2	6.99	26.8	7.68
8/5/2020					
8/6/2020					
8/7/2020					
8/8/2020					

(continued)

Table 4.5-4. (Continued)

Day	Time	Collection		Head Pond	
		Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
8/9/2020	800	22.0	7.88	22.0	6.89
8/10/2020	724	22.3	6.8	22.3	7.06
8/11/2020	730	22.6	7.22	22.3	6.76
8/12/2020	740	22.5	6.65	22.3	6.67
8/13/2020	738	22.6	6.34	22.6	7.80
8/14/2020	800	22.8	6.98	22.7	7.20
8/15/2020	746	22.6	6.21	22.7	6.40
8/16/2020	905	22.9	6.55	23.0	6.55
8/17/2020	733	22.5	6.77	22.8	6.45
8/18/2020	740	22.6	6.73	22.8	6.75
8/19/2020	745	23.1	7.31	23.1	7.06
8/20/2020	745	22.7	6.84	23.1	6.82
8/21/2020	805	22.5	5.75	22.9	5.10
8/22/2020	745	23.3	5.70	23.3	4.70
8/23/2020	800	23.5	5.57	23.4	4.64
8/24/2020	818	23.6	6.65	23.1	6.83
8/25/2020	757	23.6	7.10	23.8	7.00
8/26/2020	755	23.3	7.89	23.7	7.70
8/27/2020	747	23.3	7.66	23.5	7.27
8/28/2020	800	23.4	7.80	23.7	6.86
8/29/2020	749	24.2	7.24	24.3	6.20
8/30/2020	850	23.6	7.08	23.9	5.87
8/31/2020	743	23.2	8.00	23.7	7.00
9/1/2020	903	23.7	7.35	23.7	6.36
9/2/2020	735	23.3	8.03	23.4	7.14
9/3/2020	759	23.7	7.12	23.8	6.78
9/4/2020	845	23.5	8.08	23.5	8.13
9/5/2020	1015	23.2	7.54	24.3	7.14
9/6/2020	850	22.8	7.51	23.4	6.28
9/7/2020	751	22.6	7.49	23.3	6.97
9/8/2020	925	23.5	7.80	24.0	6.80
9/9/2020	756	23.7	6.68	23.8	4.78
9/10/2020	725	24.4	7.50	23.9	4.49
9/11/2020	801	23.7	6.16	23.7	3.96
9/12/2020	831	23.4	5.81	23.7	3.06
9/13/2020	747	22.7	6.25	23.2	4.60
9/14/2020	725	23.4	5.96	23.6	4.04
9/15/2020	800	21.8	7.00	22.8	5.70
9/16/2020	800	21.6	7.17	22.2	6.35
9/17/2020	745	21.5	6.91	21.8	5.97
9/18/2020	800	21.1	7.64	21.5	7.02
9/19/2020	743	20.0	7.77	20.9	7.21
9/20/2020	855	19.2	9.25	20.2	8.08

(continued)

Table 4.5-4. (Continued)

Day	Time	Collection		Head Pond	
		Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
9/21/2020	844	18.4	8.70	19.3	8.27
9/22/2020	925	18.1	9.34	18.7	8.40
9/23/2020	1115	19.4	9.50	18.9	8.18
9/24/2020	928	18.5	8.98	18.7	7.95
9/25/2020	800	18.3	8.90	18.6	7.90
9/26/2020	715	18.5	8.46	18.8	8.35
9/27/2020	836	18.0	7.80	18.9	6.90
9/28/2020	800	19.1	7.76	19.0	6.64
9/29/2020	1010	19.7	7.31	19.6	6.40
9/30/2020	825	19.2	8.82	19.6	8.84
10/1/2020	808	18.3	7.63	18.6	6.87
10/2/2020	1001	18.6	6.91	18.6	5.69
10/3/2020	925	17.5	6.58	18.1	5.13

Table 4.5-5: Rainfall (mg/L) Reading Taken at the Collection Facility, Octoraro Creek Eel Facility, 2020

Day	June	July	August	September	October
1		0.00	0.00	0.00	0.00
2		0.00	0.10	0.10	0.40
3		0.00	0.00	0.40	0.00
4		0.08	**1.75**	0.00	
5		0.00	*	0.00	
6		0.00	*	0.00	
7		**2.10**	*	0.00	
8		0.00	*	0.00	
9		0.00	0.00	0.00	
10		0.00	0.00	0.02	
11		**1.30**	0.00	0.45	
12		0.00	0.00	0.00	
13		0.00	0.00	0.00	
14		0.00	0.00	0.00	
15		0.00	0.00	0.00	
16		0.00	0.00	0.00	
17		0.00	0.35	0.00	
18		0.00	0.10	0.00	
19		0.00	0.30	0.00	
20		0.00	0.00	0.00	
21		0.00	0.00	0.00	
22		0.10	0.00	0.00	
23		0.30	0.00	0.00	
24		0.40	0.00	0.00	
25		0.10	**1.75**	0.00	
26		0.00	0.00	0.60	
27	0.01	0.00	0.00	0.10	
28	0.00	0.00	0.00	0.00	
29	0.00	0.00	0.00	0.00	
30	0.00	0.00	0.40	**1.60**	
31		0.30	0.30		

* No sampling when ramp was out due to high water damage
Bolded values represent rainfall amounts over 1.0 inches

Table 4.6-1: Eel Transport/Stocking Data, 2020

Location of stocking	Number of Eels	Died (Mortality)			Removed for Analysis	Removed for SRBC	Number Stocked
		Collection Tank	Holding Tank	Transported			
Octoraro Creek Collection Tanks	3,597	0 (0.00%)					
Transported to Conowingo Eel Collection Facility	3,597			0 (0.00%)			3,597
Conowingo Collection Tank	254,651	68 (0.03%)	**2,155 (0.84%)**		96	40	255,889
Total Transported from Conowingo Eel Collection Facility	255,889			479 (0.19%)			255,410

Bolded value is assumed as worst case, could be eels from Octoraro or Conowingo

Table 4.7-1: Calibration of Flows (Gallons per Minute) in the Octoraro Creek Eel Facility, 2020

	DATE						
	7/1	**7/8***	**7/16***	**7/22***	**7/28***	**8/12***	**8/19***
Enkamat Ramp							
Spray bar	8.1	6.9	8.1	6.8	8.0	5.2	5.7
Collection Tank drain	1.5	1.4	1.8	1.5	1.5	2.3	1.6
Top Attraction flow	6.6	5.5	6.3	5.3	6.5	3.0	4.1
Bottom Attraction flow	48.0	48.0	41.3	44.0	39.8	39.0	43.5
Total Attraction flow	56.1	54.9	49.4	50.8	47.7	44.2	49.2

* Cleaned pump/barrel, manifold, and hoses to increase flow

	DATE					
	8/26*	**9/2***	**9/9***	**9/16***	**9/23***	**10/2***
Enkamat Ramp						
Spray bar	4.5	5.4	5.4	5.4	6.9	6.8
Collection tank drain	1.5	1.8	1.3	1.4	2.0	2.4
Top Attraction flow	3.1	3.7	4.1	4.0	4.9	4.4
Bottom Attraction flow	42.0	42.8	43.5	42.0	41.3	39.6
Total Attraction Flow	46.5	48.2	48.9	47.4	48.2	46.4

* Cleaned pump/barrel, manifold, and hoses to increase flow

Table 5.0-1: Comparison of Octoraro Creek Eel Ramps, 2015-2020

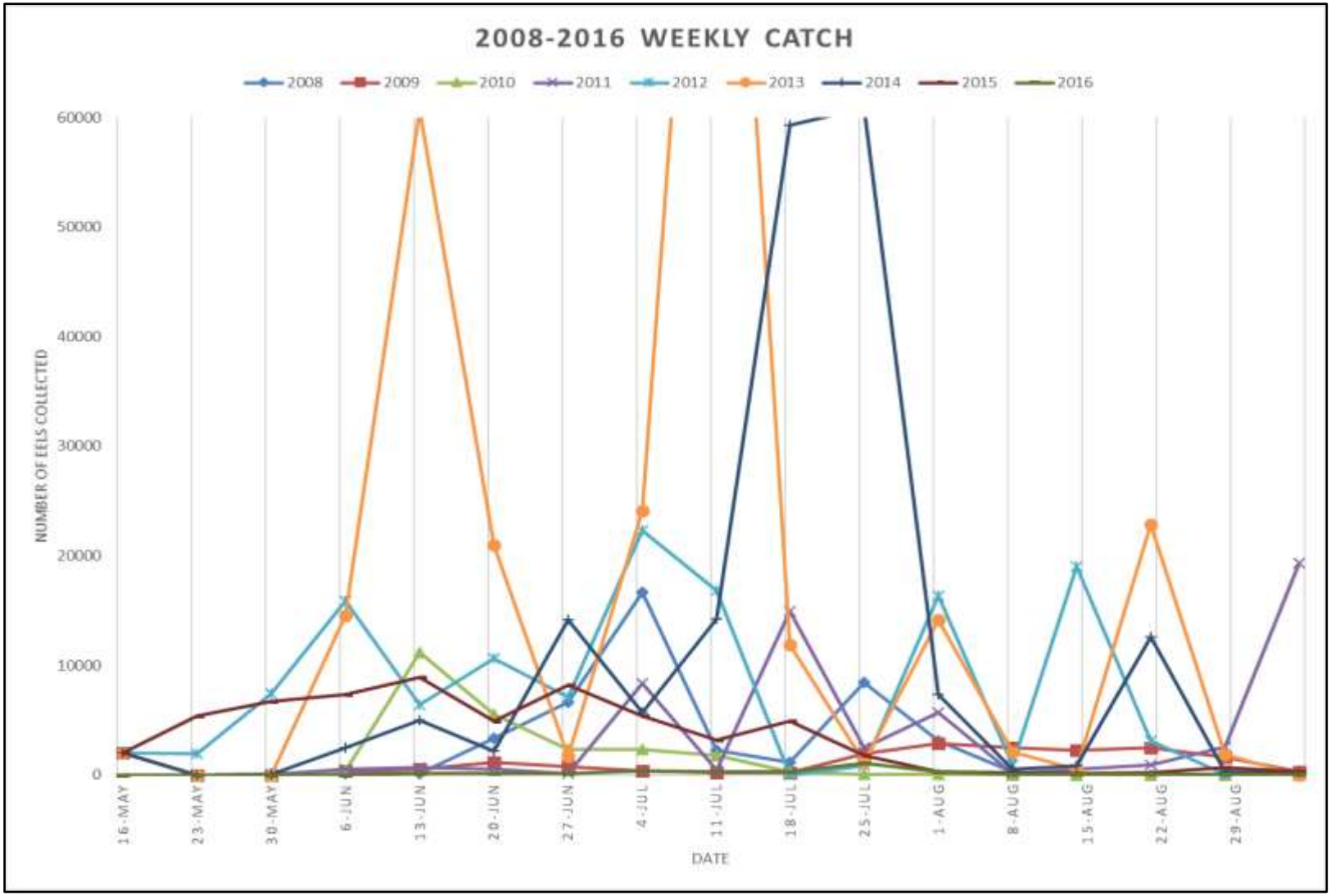
Watershed area 540 km^2
Approximate Distance from Ocean to ramp 341 km

	2015	2016	2017	2018	2019	2020	Average
Eels Collected	7,197	21,094	11,347	4,203	14,170	3,597	10,268
Average Size (mm)	129.4	130.9	135.4	141.6	129.9	125.8	132.2
Range of Sizes (mm)	95-232	99-202	99-245	100-259	93-252	91-170	
Days of Operation	89	138	138	135	138	95	122.2
Average eels per day	80.9	152.9	82.2	31.1	102.7	37.9	81.3
Average creek flow (cfs)	180.9	121.3	138.0	411.0	240.0	224.0	219.2
Range of flows (cfs)	60-1,490	43-512	51-557	88-2,370	63-1,610	64-3,920	

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 2.0-2: Location of the Juvenile Eel Collection Facility on South Shore (Left Bank) Of Octoraro Creek Downstream of Art Building

Figure 2.0-3: Peak Timing of Historical Eel Collections at USFWS* Eel Passage at Conowingo, 2008-2016



*Data from the USFWS, Minkkinen and Park 2014 and personal communication with USFWS, Christopher Reily, October 27, 2016

Figure 3.1-1: Scaffolding and Collection Tank on top of the hill, Octoraro Creek Eel Facility, 2020

Figure 3.1-2: Rainfall gauge, Octoraro Creek Eel Facility, 2020

Figure 3.1-3: Braces and scaffolding supporting longer ramp, Octoraro Creek Eel Facility, 2020

Figure 3.1-4: Additional length of hose for attraction flow, Octoraro Creek Eel Facility, 2020

Figure 3.2-1: Measuring Juvenile Eels to Nearest Millimeter While Sedated, Octoraro Creek Eel Facility, 2020

Figure 3.2-2: Weighting Juvenile Eels in Grams While Sedated, Octoraro Creek Eel Facility, 2020

Figure 3.3-1: Small Eel Transport Tank, Octoraro Creek Eel Facility, 2020

Figure 4.1-1: Daily Eel Catch, Octoraro Creek Eel Facility, 2020

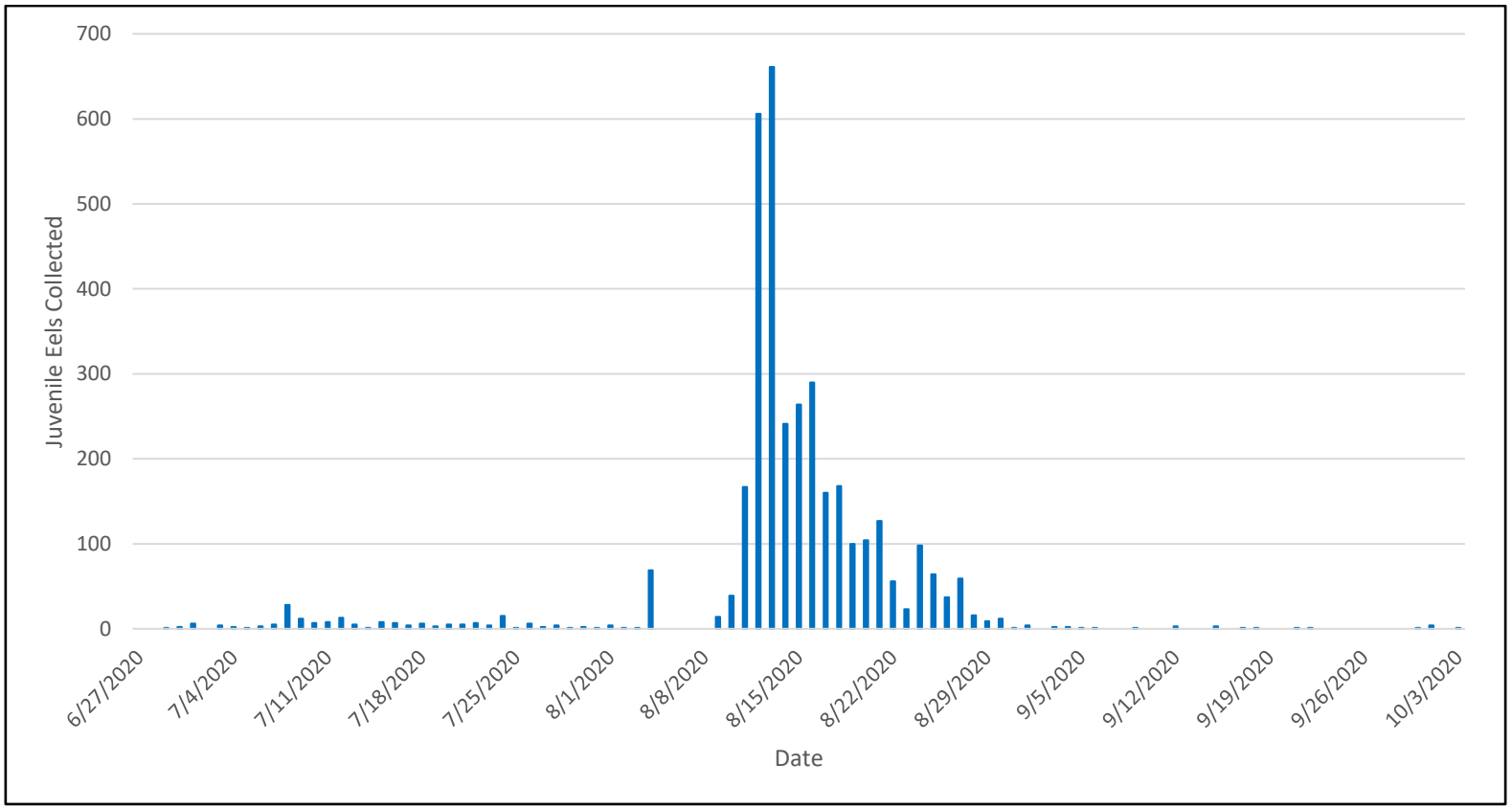


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Figure 4.2-1: Image of Minor Hemorrhage Caudal Tail, Octoraro Creek Eel Facility, 2020

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Figure 4.2-2: Image of Scrapes to the Body, Octoraro Creek Eel Facility, 2020

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Figure 4.3-1: Percentage Eel Catch per Week, Octoraro Creek Eel Facility, 2020

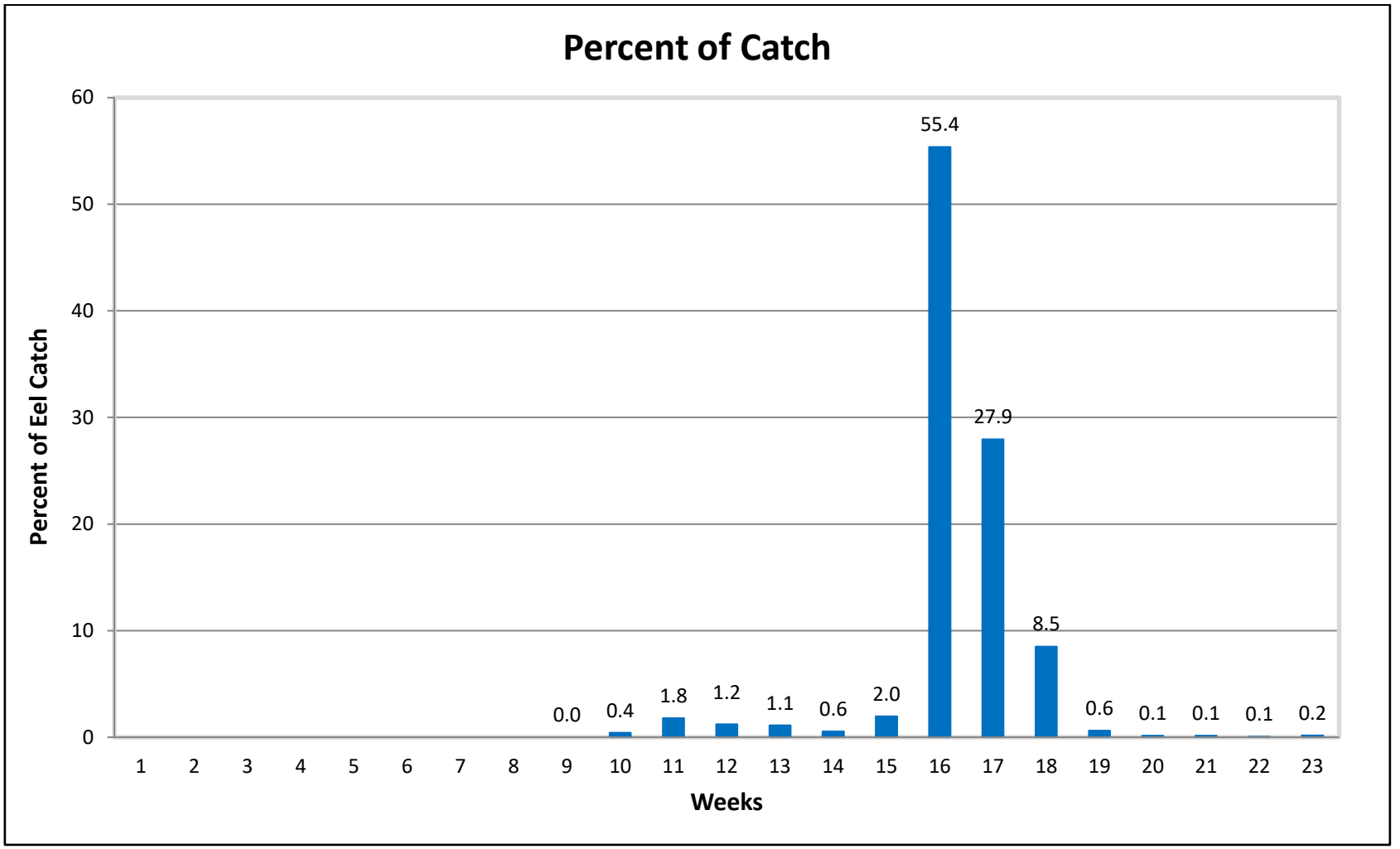

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Figure 4.5-1: Daily Eel Catch and Daily Average Creek Flow (cfs, top graph) and Weekly Eel Catch and Weekly Average Creek Flow (cfs, bottom graph), Octoraro Creek Eel Facility, 2020

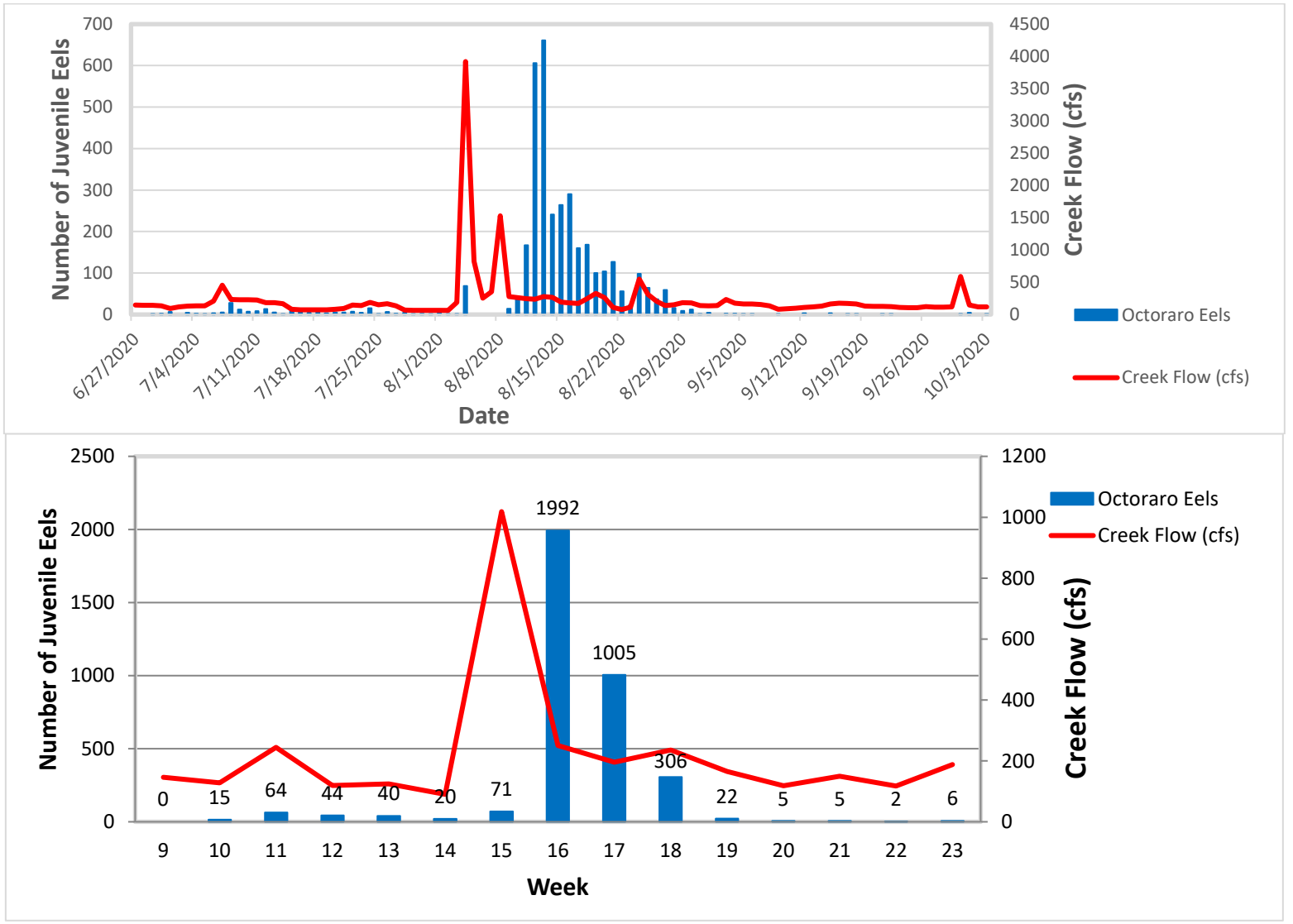

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Figure 4.5-2: Eel Catch to Lunar Fraction (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2020 (*1.0 Equals Full Moon*)

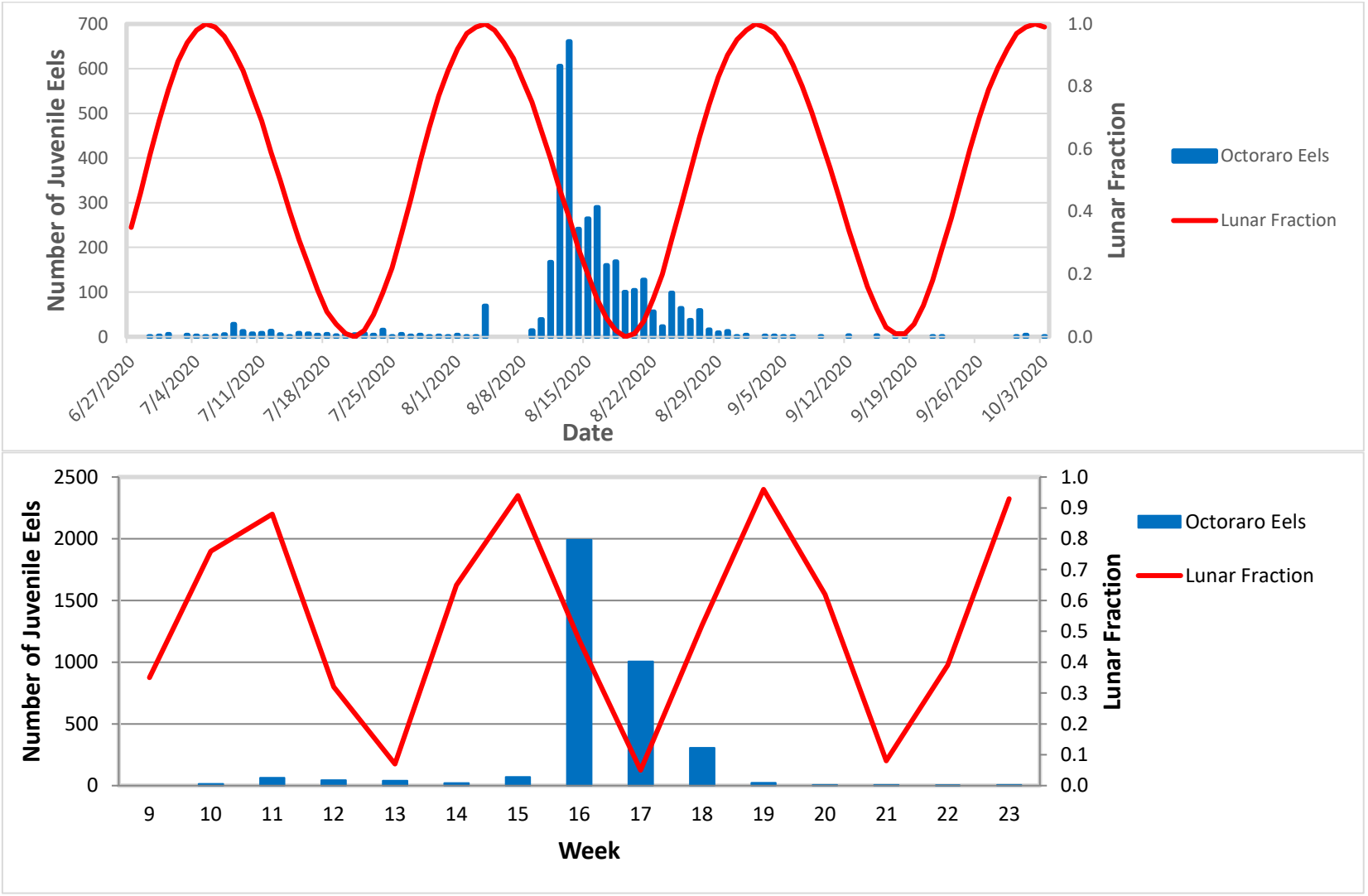

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Figure 4.5-3: Eel Catch to Water Temperature (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2020

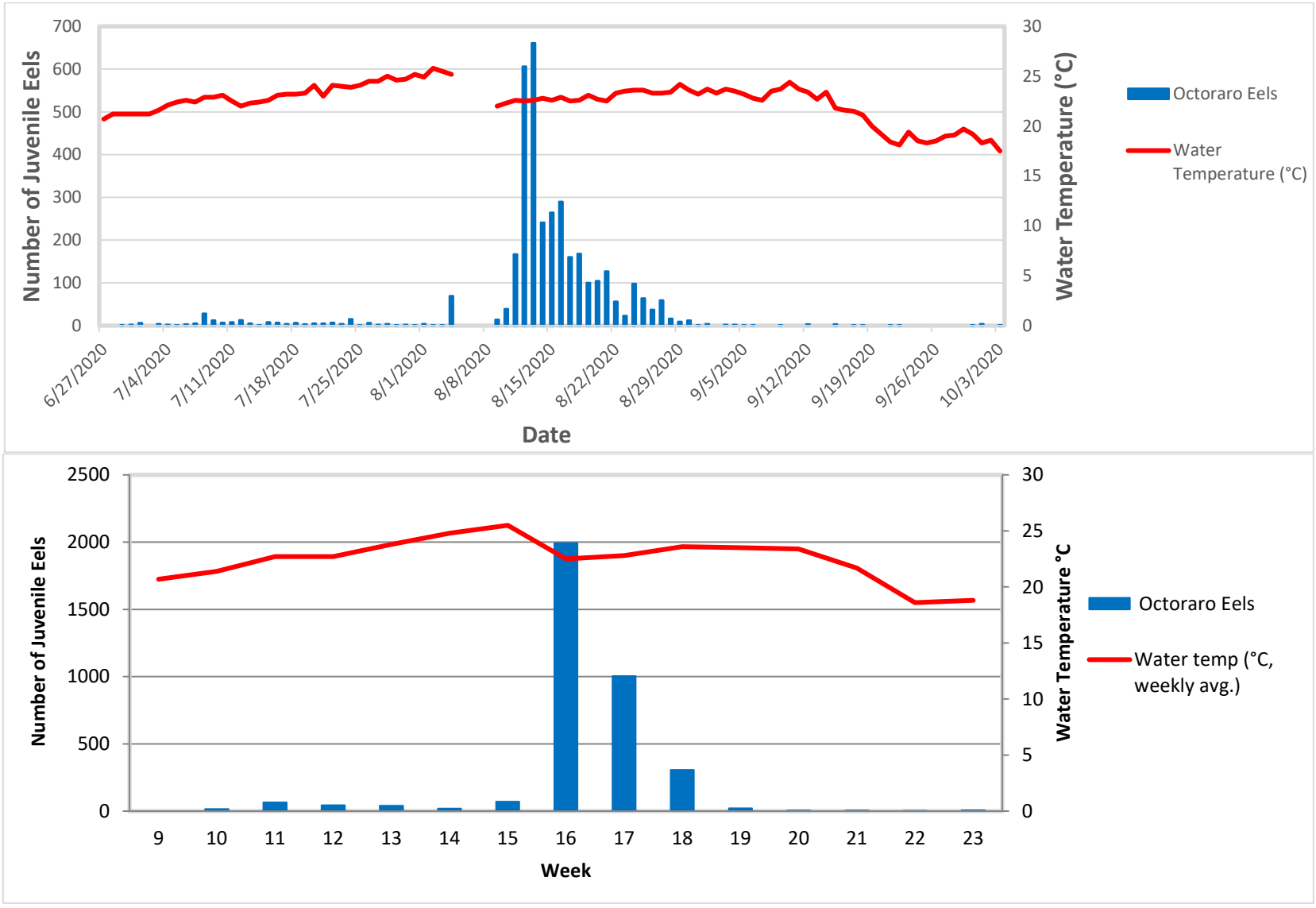

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Figure 4.5-4: Comparison of Dissolved Oxygen Readings in Collection Tanks and Head Pond, Octoraro Creek Eel Facility, 2020

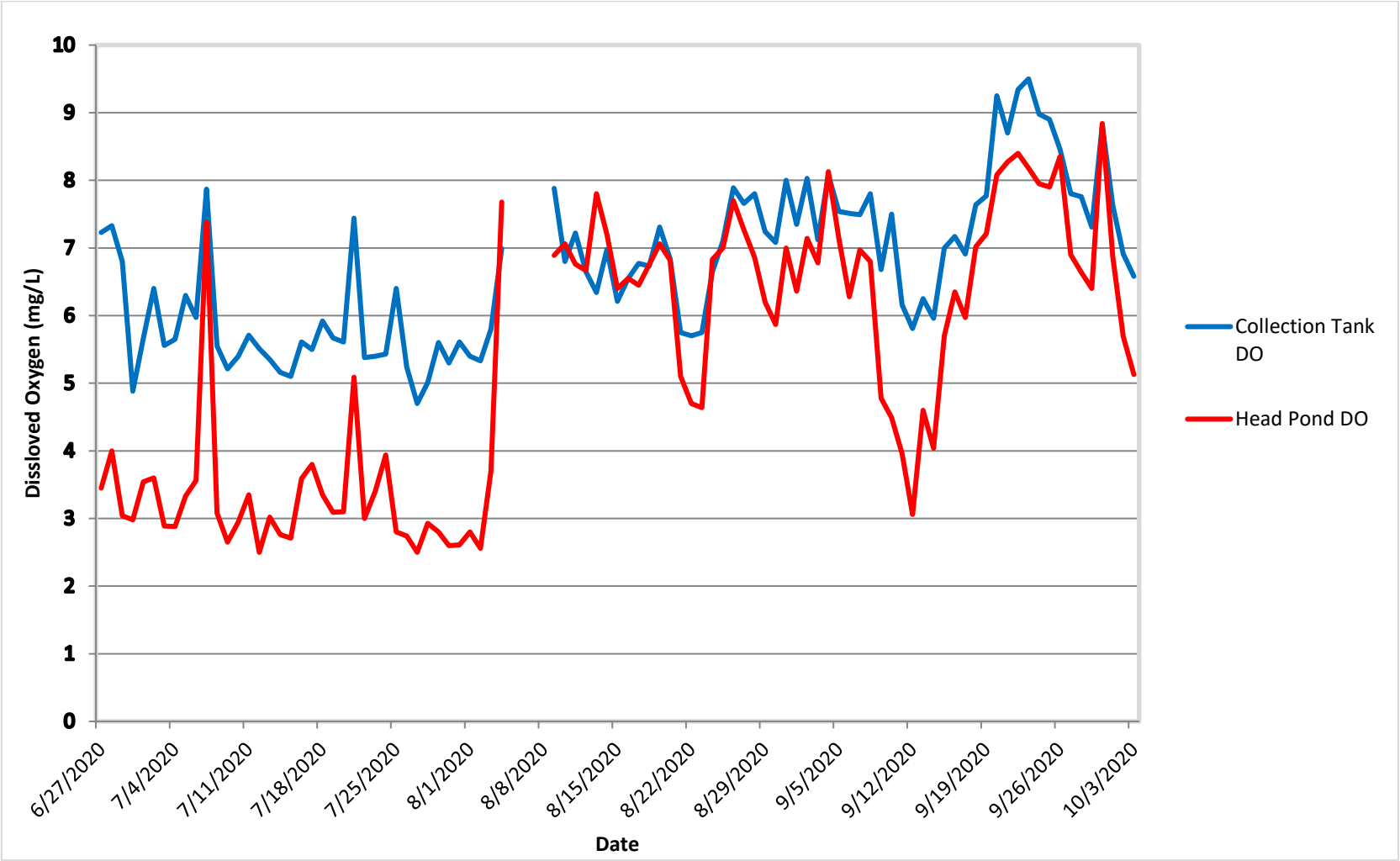

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Figure 4.5-5: Eel Catch to Dissolved Oxygen (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2020

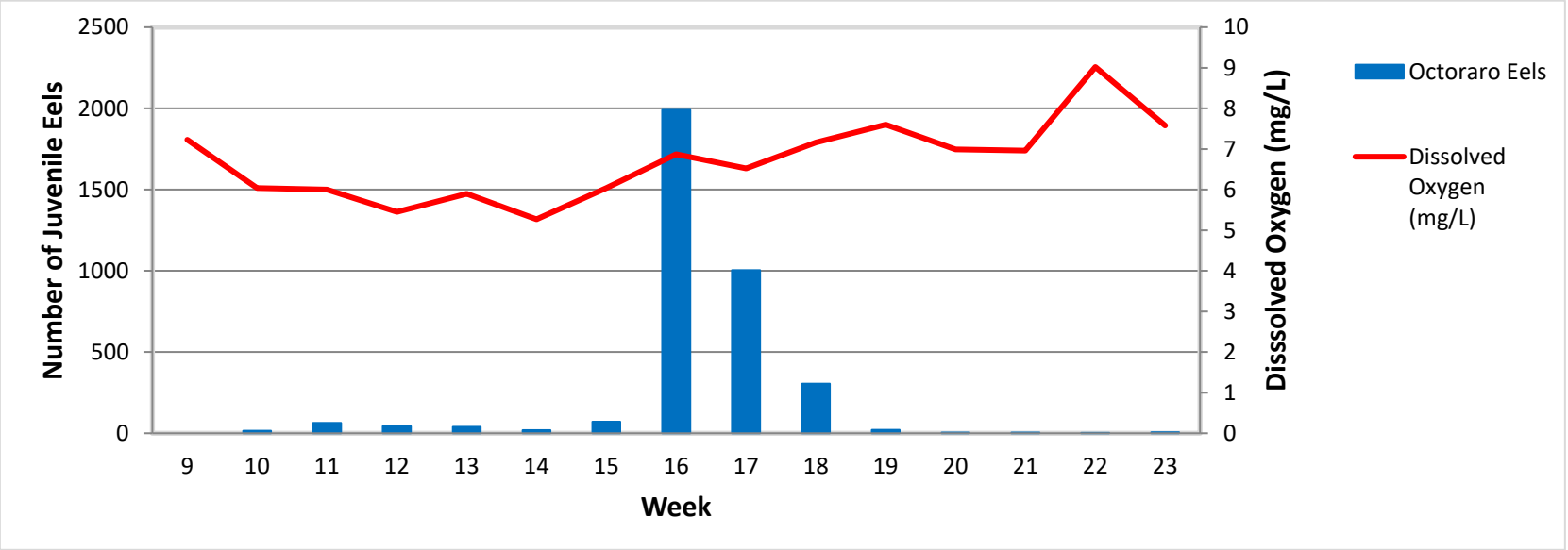

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Figure 4.5-5: Eel Catch to Rainfall (Daily above, Weekly Average below), Octoraro Creek Eel Facility, 2020

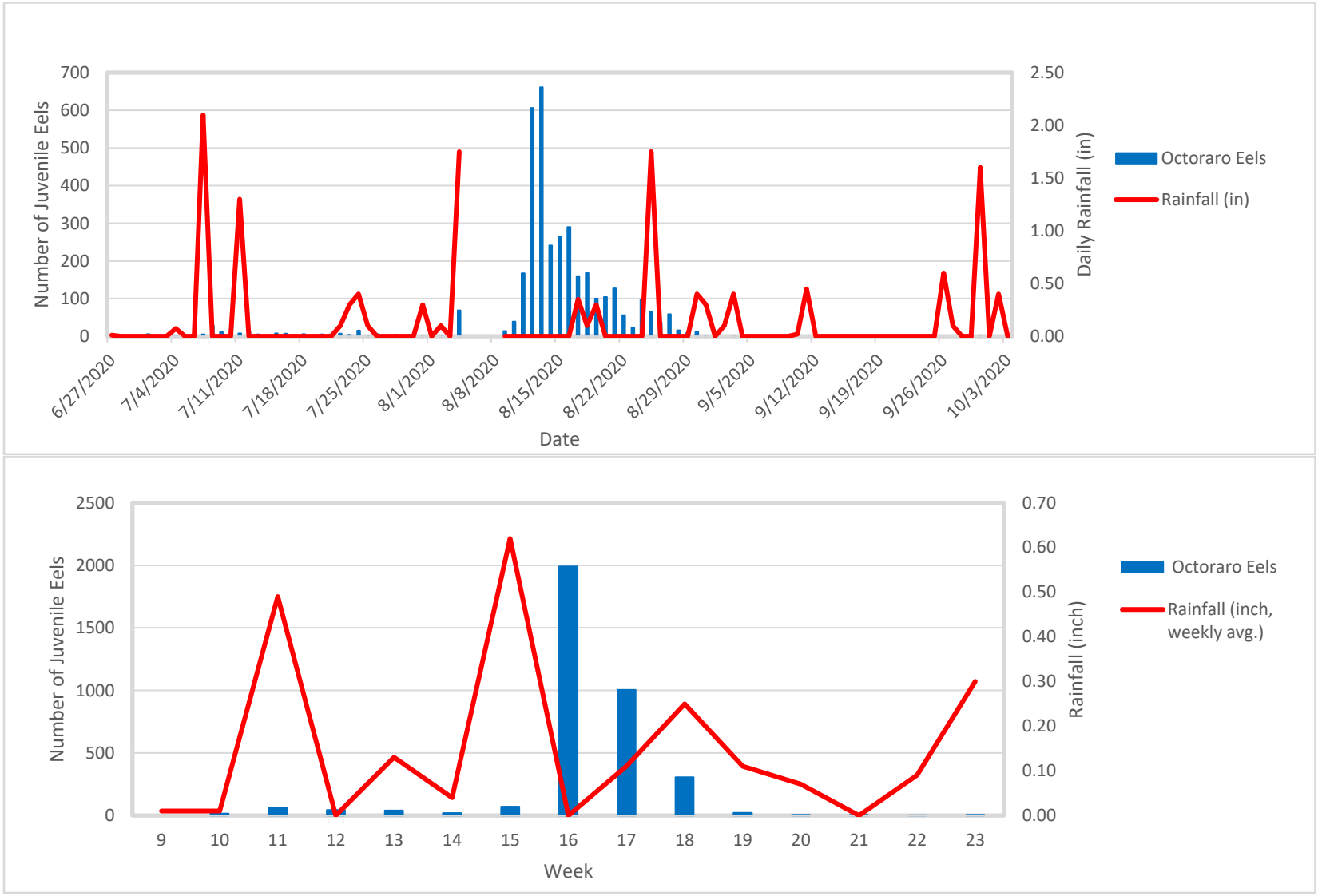

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Figure 5.0-1: Cobble/gravel Outcrop Downstream of the Eel Ramp Entrance, Octoraro Creek Eel Facility, 2020

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Figure 5.0-2: Weekly Catch and Average Creek Flow, Octoraro Creek Eel Facility, 2015-2020

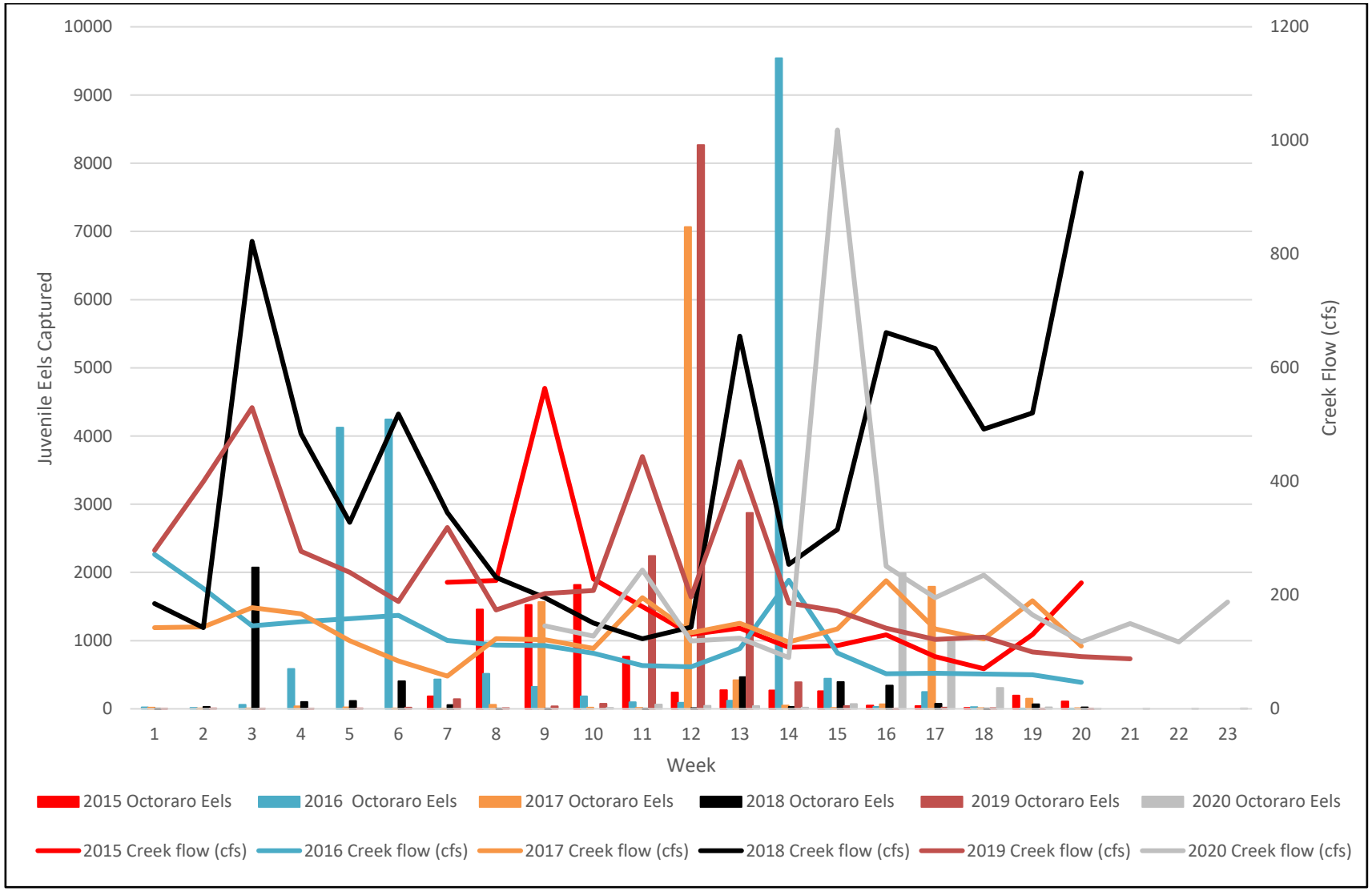

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Figure 5.0-3 Damaged from High Creek Flows, Octoraro Creek Eel Facility, 2020

Figure 5.0-4 Damaged from High Creek Flows, Octoraro Creek Eel Facility, 2020

Appendix A:
Correspondence with CWA and COVID-19 information, 2020

COMMONWEALTH OF PENNSYLVANIA
OFFICE OF THE GOVERNOR

AMENDMENT TO THE ORDER OF
THE GOVERNOR OF THE COMMONWEALTH OF PENNSYLVANIA REGARDING
THE CLOSURE OF ALL BUSINESSES THAT ARE NOT LIFE SUSTAINING

I hereby amend my Order directing "The Closure of All Businesses that Are Not Life Sustaining" dated March 19, 2020, as subsequently amended. Section 1 of that Order is amended by deleting Section 1 in its entirety and replacing it with the following:

Section 1: Prohibition on Operation of Certain Businesses That Are Not Life Sustaining

All prior orders and guidance regarding business closures, to the extent they conflict with this Order, are hereby superseded.

No person or entity shall operate a place of business in the Commonwealth that is not a life-sustaining business regardless of whether the business is open to members of the public unless the business has been designated to conduct operations as described below. This prohibition does not apply to virtual or telework operations (e.g., work from home), so long as social distancing and other mitigation measures are followed in such operations. Life-sustaining businesses may remain open, but they must follow, at a minimum, the social distancing practices and other mitigation measures described by the Centers for Disease Control and Prevention to protect workers and patrons and, as applicable, the requirements of the "Order of the Secretary of the Pennsylvania Department of Health Directing Building Safety Measures" issued April 6, 2020, and the "Order of the Secretary of the Pennsylvania Department of Health Directing Public Health Safety Measures for Businesses Permitted to Maintain In-person Operations" issued April 15, 2020.

The following businesses are authorized to conduct operations in the manner described, as long as they follow, at a minimum, the aforementioned guidance and Orders:

A. Online motor vehicle sales are authorized to commence statewide immediately;
B. The Pennsylvania Liquor Control Board is authorized to commence curbside pickup sales statewide immediately;
C. Limited construction activity is authorized to commence in-person operations statewide beginning on May 8, 2020.

A list of businesses that may open or remain open is attached to and incorporated into this Order.

Enforcement actions previously commenced against businesses that are out of compliance on March 23, 2020, at 8:00 a.m. and enforcement of this Order is ongoing.

This Amendment is effectively immediately. The March 19, 2020, Order, as amended, remains unchanged in every other respect.

GIVEN under my hand and the Seal of the Governor, at the city of Harrisburg, on this twentieth day of April two thousand twenty, the year of the commonwealth the two hundred and forty-fourth.

TOM WOLF
Governor

pennsylvania
DEPARTMENT OF HEALTH

Order of the Secretary of the Pennsylvania Department of Health Directing Public Health Safety Measures for Businesses Permitted to Maintain In-person Operations

The 2019 novel coronavirus (COVID-19) is a contagious disease that is rapidly spreading from person to person in the Commonwealth of Pennsylvania. COVID-19 can be transmitted from people who are infected with the virus even if they are asymptomatic or their symptoms are mild, such as a cough. Additionally, exposure is possible by touching a surface or object that has the virus on it and then touching one's mouth, nose, or eyes.

COVID-19 is a threat to the public's health, for which the Secretary of Health may order general control measures, including, but not limited to, closure, isolation, and quarantine. This authority is granted to the Secretary of Health pursuant to Pennsylvania law. *See* Section 5 of the Disease Prevention and Control Law, 35 P.S. §§ 521.1, 521.5; sections 2102 and 2106 of the Administrative Code of 1929, 71 P.S. §§ 532, 536; and the Department of Health's (Department's) regulations at 28 Pa. Code §§ 27.60-27.68 (relating to disease control measures; isolation; quarantine; movement of persons subject to isolation or quarantine; and release from isolation and quarantine). Particularly, the Secretary has the authority to take any disease control measure appropriate to protect the public from the spread of infectious disease. *See* 35 P.S. § 521.5; 71 P.S. §§ 532(a), 1402(a); 28 Pa. Code § 28.60.

Recognizing that certain life-sustaining businesses in the Commonwealth must remain open despite the need for strong mitigation to slow the spread of the virus, I am ordering certain actions to be taken by employers and their employees to protect their health and lives, the health and lives of their families, and the health and lives of the residents of the Commonwealth who depend upon their services. Special consideration is required to protect not only customers, but the workers needed to run and operate these establishments.

As cleaning, disinfecting, and other maintenance and security services performed by building service employees are critical to protecting the public health by reducing COVID-19 infection in the Commonwealth, I previously directed building safety measures in an Order that went into effect at 12:01 a.m. on April 6, 2020. Similarly, based upon the manner of COVID-19's continued and extensive spread in the Commonwealth and in the world, and its danger to Pennsylvanians, I have determined that an additional appropriate disease control measure is the further direction of safety measures for all employees and visitors at life-sustaining businesses that have remained open during the COVID-19 disaster emergency.

Accordingly, on this date, April 15, 2020, to protect the public from the spread of COVID-19, I hereby order:

A. A business that is authorized to maintain in-person operations, other than health care providers, pursuant to the Orders that the Governor and I issued on March 19, 2020, as subsequently amended, shall implement, as applicable, the following social distancing, mitigation, and cleaning protocols:

(1) in addition to maintaining pre-existing cleaning protocols established in the business, as specified in paragraph (2) below, clean and disinfect high-touch areas routinely in accordance with guidelines issued by the Centers for Disease Control and Prevention (CDC), in spaces that are accessible to customers, tenants, or other individuals;

(2) maintain pre-existing cleaning protocols established by the business for all other areas of the building;

(3) establish protocols for execution upon discovery that the business has been exposed to a person who is a probable or confirmed case of COVID-19, including:

a. close off areas visited by the person who is a probable or confirmed case of COVID-19. Open outside doors and windows and use ventilation fans to increase air circulation in the area. Wait a minimum of 24 hours, or as long as practical, before beginning cleaning and disinfection. Cleaning staff should clean and disinfect all areas such as offices, bathrooms, common areas including but not limited to employee break rooms, conference or training rooms and dining facilities, shared electronic equipment like tablets, touch screens, keyboards, remote controls, and ATM machines used by the ill person, focusing especially on frequently touched areas;

b. identify employees that were in close contact (within about 6 feet for about 10 minutes) with a person with a probable or confirmed case of COVID-19 from the period 48 hours before symptom onset to the time at which the patient isolated;

i. If the employee remains asymptomatic, the person should adhere to the practices set out by the CDC in its April 8, 2020 Interim Guidance for Implementing Safety Practice for Critical Infrastructure Workers Who May Have Had Exposure to a Person with Suspected or Confirmed COVID-19;

ii. If the employee becomes sick during the work day, the person should be sent home immediately. Surfaces in the employee's workspace should be cleaned and disinfected. Information on other employees who had contact with the ill employee during the time the employee had symptoms

and 48 hours prior to symptoms should be compiled. Others at the workplace with close contact within 6 feet of the employee during this time would be considered exposed;

iii. Promptly notify employees who were close contacts of any known exposure to COVID-19 at the business premises, consistent with applicable confidentiality laws;

iv. ensure that the business has a sufficient number of employees to perform the above protocols effectively and timely;

c. implement temperature screening before an employee enters the business, prior to the start of each shift or, for employees who do not work shifts, before the employee starts work, and send employees home that have an elevated temperature or fever of 100.4 degrees Fahrenheit or higher. Ensure employees practice social distancing while waiting to have temperatures screened;

d. employees who have symptoms (*i.e.*, fever, cough, or shortness of breath) should notify their supervisor and stay home;

e. sick employees should follow CDC-recommended steps. Employees should not return to work until the CDC criteria to discontinue home isolation are met, in consultation with healthcare providers and state and local health departments. Employers are encouraged to implement liberal paid time off for employees who do not return to work as set forth above.

(4) stagger work start and stop times for employees when practicable to prevent gatherings of large groups entering or leaving the premises at the same time;

(5) provide sufficient amount of space for employees to have breaks and meals while maintaining a social distance of 6 feet, while arranging seating to have employees facing forward and not across from each other in eating and break settings;

(6) stagger employee break times to reduce the number of employees on break at any given time so that appropriate social distancing of at least 6 feet may be followed;

(7) limit persons in employee common areas (such as locker or break rooms, dining facilities, training or conference rooms) at any one time to the number of employees that can maintain a social distance of 6 feet;

(8) conduct meetings and trainings virtually (*i.e.*, by phone or through the internet). If a meeting must be held in person, limit the meeting to the fewest number of employees possible, not to exceed 10 employees at one time, and maintain a social distance of 6 feet;

(9) provide employees access to regular handwashing with soap, hand sanitizer, and disinfectant wipes and ensure that common areas (including but not limited to break rooms, locker rooms, dining facilities, rest rooms, conference or training rooms) are cleaned on a regular basis, including between any shifts;

(10) provide masks for employees to wear during their time at the business, and make it a mandatory requirement to wear masks while on the work site, except to the extent an employee is using break time to eat or drink, in accordance with the guidance from the Department of Health and the CDC. Employers may approve masks obtained or made by employees in accordance with Department of Health guidance;

(11) ensure that the facility has a sufficient number of employees to perform all measures listed effectively and in a manner that ensures the safety of the public and employees;

(12) ensure that the facility has a sufficient number of personnel to control access, maintain order, and enforce social distancing of at least 6 feet;

(13) prohibit non-essential visitors from entering the premises of the business; and

(14) ensure that all employees are made aware of these required procedures by communicating them, either orally or in writing, in their native or preferred language, as well as in English or by a methodology that allows them to understand.

B. In addition to the above, the following measures apply to businesses, other than health care providers, that serve the public within a building or a defined area:

(1) where feasible, businesses should conduct business with the public by appointment only and to the extent that this is not feasible, businesses must limit occupancy to no greater than 50% of the number stated on the applicable certificate of occupancy at any given time, as necessary to reduce crowding in the business, and must maintain a social distance of 6 feet at check-out and counter lines, and must place signage throughout each site to mandate social distancing for both customers and employees;

(2) based on the building size and number of employees, alter hours of business so that the business has sufficient time to clean or to restock or both;

(3) install shields or other barriers at registers and check-out areas to physically separate cashiers and customers or take other measures to ensure social distancing of customers from check-out personnel, or close lines to maintain a social distance between of 6 feet between lines;

(4) encourage use of online ordering by providing delivery or pick-up options;

(5) designate a specific time for high-risk and elderly persons to use the business at least once every week if there is a continuing in-person customer-facing component;

(6) require all customers to wear masks while on premises, and deny entry to individuals not wearing masks, unless the business is providing medication, medical supplies, or food, in which case the business must provide alternative methods of pick-up or delivery of such goods; however, individuals who cannot wear a mask due to a medical condition (including children under the age of 2 years per CDC guidance) may enter the premises and are not required to provide documentation of such medical condition;

(7) in businesses with multiple check-out lines, only use every other register, or fewer. After every hour, rotate customers and employees to the previously closed registers. Clean the previously open registers and the surrounding area, including credit card machines, following each rotation;

(8) schedule handwashing breaks for employees at least every hour; and

(9) where carts and handbaskets are available for customers' use, assign an employee to wipe down carts and handbaskets before they become available to each customer entering the premises.

This Order shall take effect immediately and be enforceable as of 8:00 p.m. on April 19, 2020.

Rachel Levine, MD
Secretary of Health

5

GUIDANCE FOR BUSINESSES IN THE CONSTRUCTION INDUSTRY PERMITTED TO OPERATE DURING THE COVID-19 DISASTER EMERGENCY

INTENT

The virus that causes Coronavirus 2019 Disease ("COVID-19") is easily transmitted, especially in group settings, and it is essential that the spread of the virus be slowed to safeguard public health and safety. Previously, the Governor and Secretary of Health ordered most construction projects to cease unless they were supporting life-sustaining businesses or activities. Recognizing that the construction industry is vital to Pennsylvania's economy, construction activities may resume in accordance with this guidance.

Businesses in the Commonwealth that have been permitted to maintain in-person operations during the disaster emergency, other than health care providers, must take several precautions to protect their employees, their employees' families, and members of their communities. Businesses that are permitted to maintain in-person operations are those authorized under the Governor's and Secretary's Non-Life Sustaining Business Closure Orders, an exemption from those orders, or subsequent applicable order from the Governor and Secretary. All businesses (especially those that were originally closed and later permitted to re-open a portion of their operations) must review these guidelines and commit to ensuring the health and safety of their employees and the public, including construction businesses currently conducting in-person operations and those now able to resume activities.

BUSINESSES SUBJECT TO THIS GUIDANCE

Beginning May 1, 2020, all businesses in the construction industry in the Commonwealth, including those in new construction, renovation, and repair, as well as land subdivision and design-related field activities, are permitted to maintain in-person operations pursuant to the Governor's and Secretary of Health's April 20, 2020 amendments to the Business Closure Orders so long as their activities strictly adhere to this guidance. Construction projects previously granted an exemption to continue in-person operations may continue operations but must adhere to this guidance.

Prior to May 1, all businesses in the construction industry should continue to follow existing Administration orders and guidance, and may continue to maintain in-person operations to the extent authorized by any existing exemptions.

POLICY

It is the policy of the Administration to ensure that all businesses in the construction industry subject to this guidance conduct operations in the manner best designed to prevent or mitigate the spread of COVID-19 and ensure the safety of the employers, employees and the public as a whole.

All construction businesses authorized to conduct in-person operations in the Commonwealth must adhere to requirements of this guidance, as well as all applicable business and building safety orders issued by the Secretary of Health.

Local political units may elect to impose more stringent requirements than those contained in this guidance. In such instances, businesses must adhere to the more stringent requirements.

Issued 04-23-20

ALL CONSTRUCTION ACTIVITIES

All businesses and employees in the construction industry must do the following:

- Follow all applicable provisions of the Order of the Secretary of Health providing for business safety measures, issued April 15, 2020, including but not limited to provisions requiring that every person present at a work site wear masks/face coverings, and provisions requiring the establishment of protocols for execution upon discovery that the business has been exposed to a person who is a probable or confirmed case of COVID-19.
- Follow all applicable provisions of the Order of the Secretary of Health providing for building safety measures, issued April 5, 2020.
- Follow other applicable Department of Health (DOH) and Centers for Disease Control and Prevention (CDC) guidance.
- Require social distancing (6-feet minimum distance between workers) unless the safety of the public or workers require deviation (e.g. drywalling, team lifting).
- Provide hand wash stations at appropriate locations on the site such as building entrances, break areas, food truck areas, offices, trailers, and job site egress areas.
- Implement cleaning or sanitizing protocols at all construction sites and projects. Identify and regularly clean and disinfect areas that are at high risk for transmission (requirements to clean common areas and regularly trafficked spaces periodically).
- Ensure all gatherings are limited to no more than 10 people, maintaining 6-foot social distancing, when required to meet, even when conducted outside.
- Use virtual meetings, and disseminate information electronically to the extent feasible.
- Stagger shifts, breaks, work areas and/or stacking of trades where feasible to minimize workers on site.
- Limit tool sharing and sanitize tools if they must be shared.
- Employ jobsite screening based on CDC guidance to determine if employees should work. Prohibit from working any employees with any symptoms of COVID-19. Encourage sick employees to stay home.
- Prohibit unnecessary visitors to any project or work site, and limit supplier deliveries.
- Limit access to enclosed spaces to the extent feasible.
- Ensure workers are traveling to and from the job site separately. Wherever possible employees should not share a vehicle.
- Identify a "Pandemic Safety Officer" for each project or work site, or, if a large-scale construction project, then for each contractor at the site. The primary responsibility of the Pandemic Safety Officer will be to convey, implement, and enforce the social distancing and other requirements of this guidance for the protection of employees, suppliers, and other personnel at the site.

RESIDENTIAL CONSTRUCTION

The Uniform Construction Code (34 Pa. Code § 401.1) defines residential buildings as "detached one-family and two-family dwellings and townhouses which are not more than three stories above grade plane in height with a separate means of egress and their accessory structures."

- All residential construction projects including new construction, renovation, and repair are authorized to conduct in-person operations; however, such projects may not permit more than four persons on the job site at any time inclusive of employees of both prime and sub contractors, but not inclusive of delivery persons, code inspectors, or similar persons who require temporary access to the site and are not directly engaged in the construction activity.

Issued 04-23-20

NON-RESIDENTIAL OR COMMERCIAL CONSTRUCTION

The Uniform Construction Code (34 Pa. Code § 401.1) defines "Commercial construction" as "a building, structure or facility that is not a residential building." This definition includes multi-unit housing and student housing.

- All commercial construction projects including new construction, renovation, and repair are authorized to conduct in-person operations; however, enclosed projects or portions of enclosed projects, may not permit more than four persons on job sites of 2,000 square feet or less, and

- One additional person is allowed for each additional 500 square feet of enclosed area over 2,000 square feet. These numbers are inclusive of employees of both prime and sub contractors, but not inclusive of delivery persons, code inspectors, or similar persons who require temporary access to the site and are not directly engaged in the construction activity. Enclosed square footage shall include all areas under roof that are under active construction at the time.

- Commercial construction firms, including particularly those managing large-scale construction projects, should consider strongly establishing a written Safety Plan for each work location containing site specific details for the implementation of this guidance to be shared with all employees and implemented and enforced by the designated Pandemic Safety Officer.

PUBLIC CONSTRUCTION

Elected political subdivisions (or "local political units" as described in the Governor's guidance), and other public entities should continue to use best judgment in exercising their authority to conduct critical construction projects. All construction decisions should appropriately balance public health and safety while ensuring the continued safety of critical infrastructure. When possible, local political units and public entities should postpone non-essential projects and only proceed with essential projects when they can implement appropriate social distancing and cleaning/disinfecting protocols, and should adhere to this guidance on all construction projects.

Local political units and public entities should officially communicate to contractors whether their specific project will be resumed. Notwithstanding any general authorization to resume construction activities, contractors should not resume work on public construction projects until directed to do so by the applicable governmental unit.

Certain commonwealth agencies and independent commissions have already issued guidance for critical or essential projects that are continuing. Those specific agency or commission directives should be followed unless there is a direct conflict with these guidelines, in which case these guidelines control. Contractors working on public construction projects must follow construction restart or resumption plans established by that agency or commission.

INSPECTIONS AND APPRAISALS

Beginning May 1, 2020, in-person inspection and appraisals related to construction financing loans, and UCC building code plan review and inspection services may be conducted as necessary for all construction projects authorized under this guidance.

Issued 04-23-20

QUESTIONS AND FURTHER GUIDANCE

Businesses that have questions about whether this guidance applies to them may email the Department of Labor and Industry at RA-LIBOIS-BUILDINGS@pa.gov.

Answers to frequently asked questions involving application of the Employee Safety Order is available here.

Businesses in the construction industry may wish to refer to PennDOT's COVID-19 Guidance for Restarting Construction Projects which provided a process for restarting construction projects that were suspended in response to COVID-19 mitigation. The guidance is available here.

Help is available for people who are struggling with their mental or emotional health or feeling anxious or overly stressed contact the Crisis Text Line by texting PA to 741-741.

ENFORCEMENT

Enforcement actions against violators of the Governor's and Secretary of Health's Orders Closing Businesses That Are Not Life Sustaining commenced on March 23, 2020, and is ongoing.

Law enforcement officers should refer to Enforcement Guidance available online here.

ADDITIONAL INFORMATION

For the most up-to-date, reliable information, please continue to refer to the Commonwealth of Pennsylvania's website for Responding to COVID-19 in Pennsylvania: https://www.pa.gov/guides/responding-to-covid-19/.

Issued 04-23-20

EXELON GENERATION COMPANY, LLC
OCTORARO CREEK EEL TRAPPING FACILITY TELECONFERENCE
June 2, 2020, 11:00 AM to 12:00 PM EST
Call-in Number: 855-470-3100 Meeting ID 6903695#

1. Summary of findings from the geophysical survey
2. Potential alternatives
    a. Interim/temporary – for 2020 season
        i. Shorten ramp and collect eels downhill of current location (See Figure 1 for sketch)
            - Smaller trap in the floodplain
            - Coordination with CWA to remove equipment
        ii. Any questions or concerns?
    b. Longer term/permanent eel structure
        i. Two possible alternatives:
            - Move gazebo uphill and extend footing down to bedrock (See Figures 2a and 2b) or
            - Leave gazebo in proposed location but construct a bridge-type structure to span the buried tailrace and distribute loads from the gazebo and ramp to the bedrock on either side of the tailrace structure (See Figures 3a and 3b)
        ii. Any questions or concerns?

Attached:

- Preliminary survey result figures
- Figures of potential alternatives

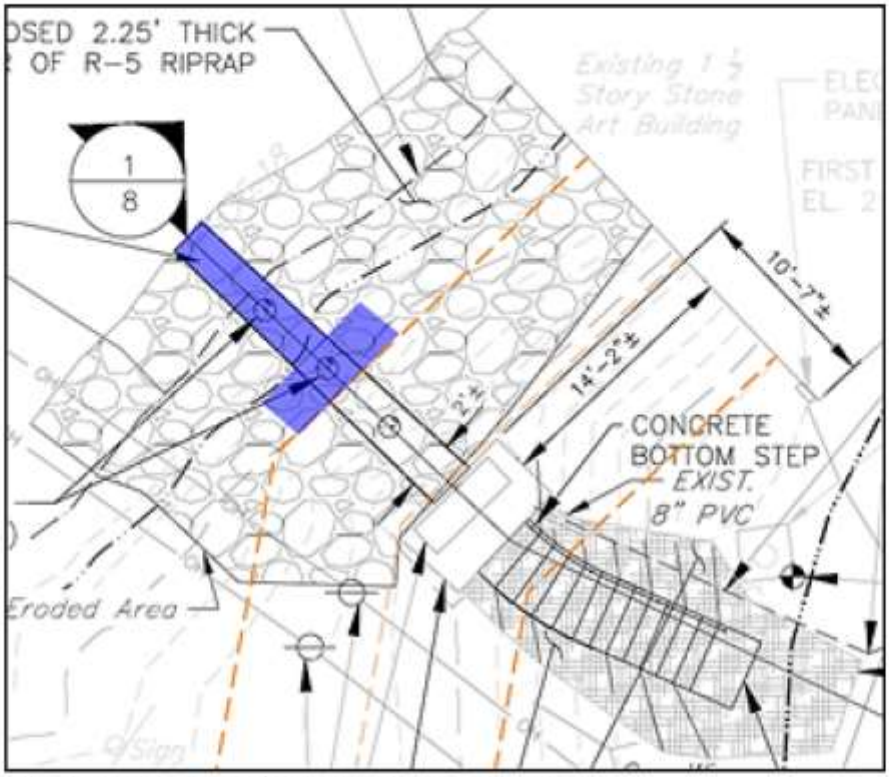


Figure 1 – Proposed Interim/Temporary Eel Collection Alternative

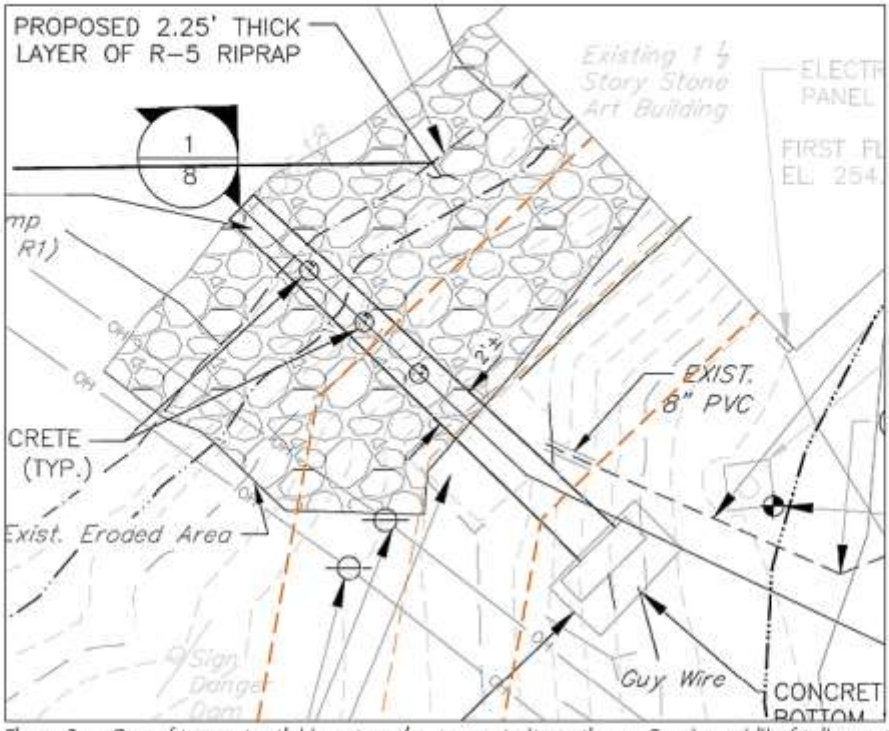


Figure 2a – One of two potential long term/permanent alternatives – Gazebo uphill of tailrace structure (plan view)

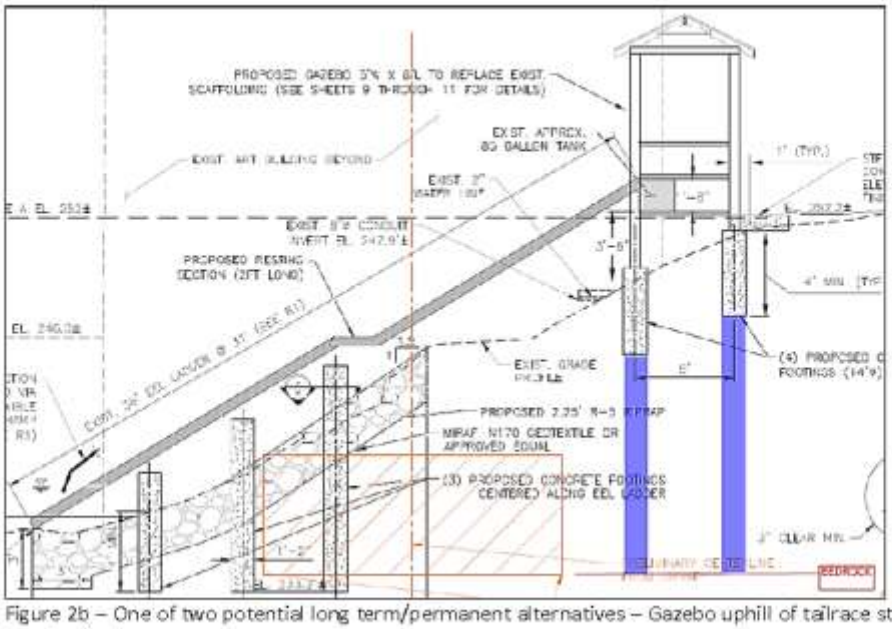


Figure 2b – One of two potential long term/permanent alternatives – Gazebo uphill of tailrace structure (profile view)

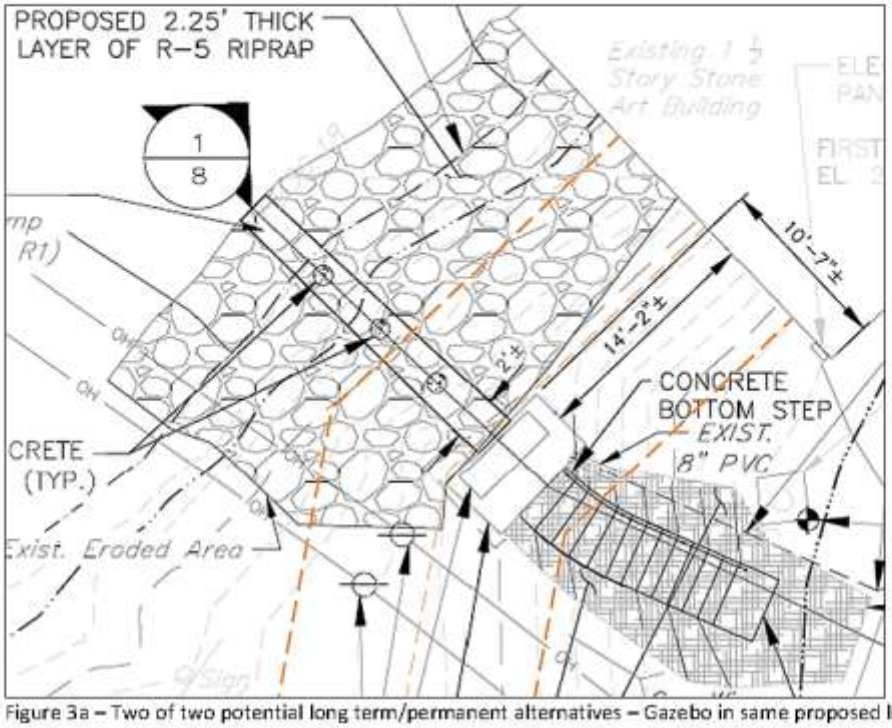


Figure 3a – Two of two potential long term/permanent alternatives – Gazebo in same proposed location but supported by bridge-type structure (plan view)

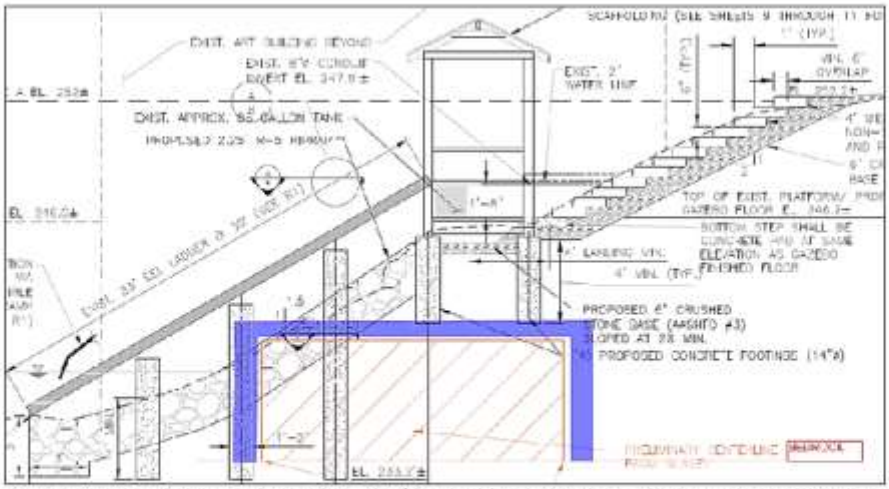
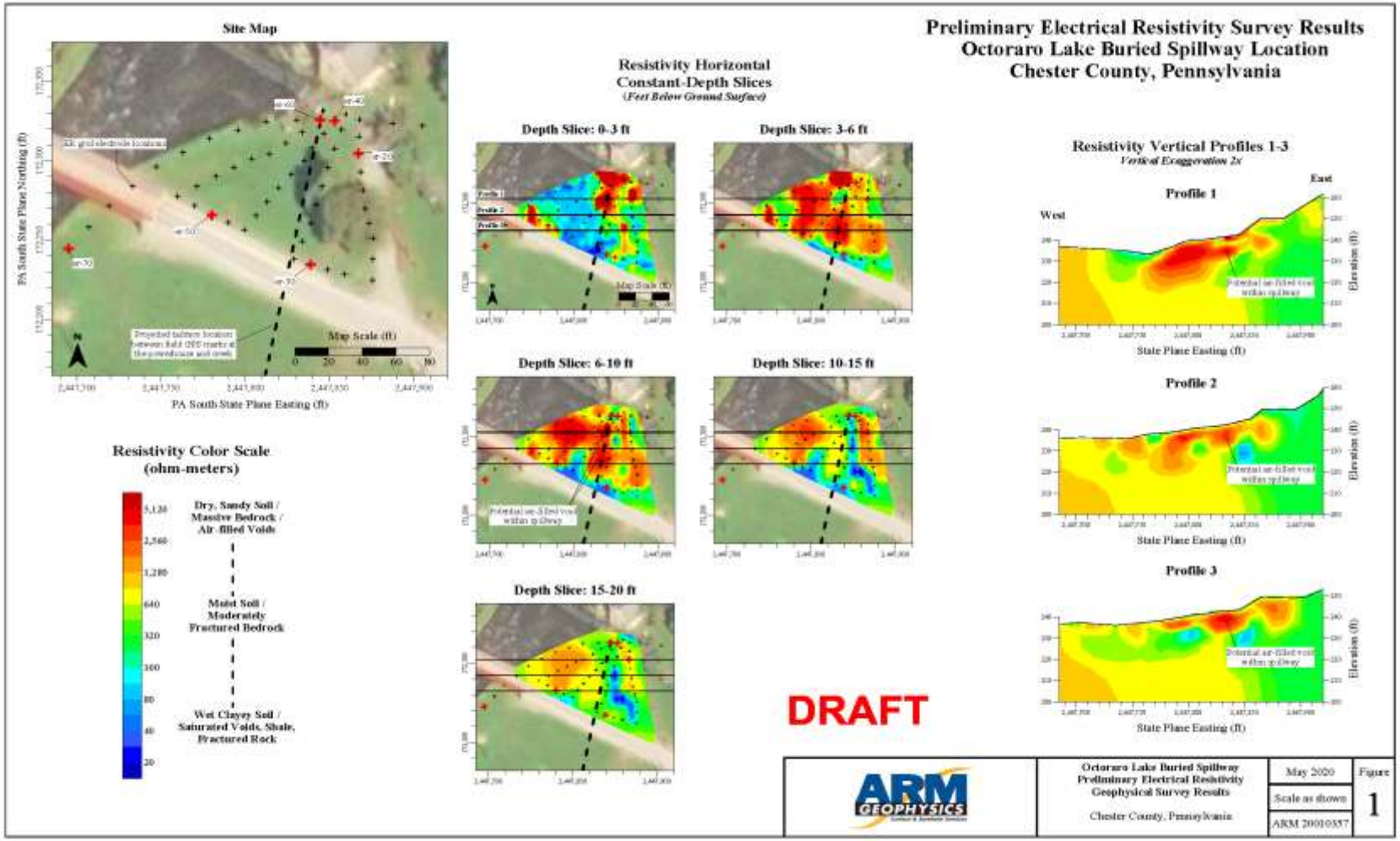
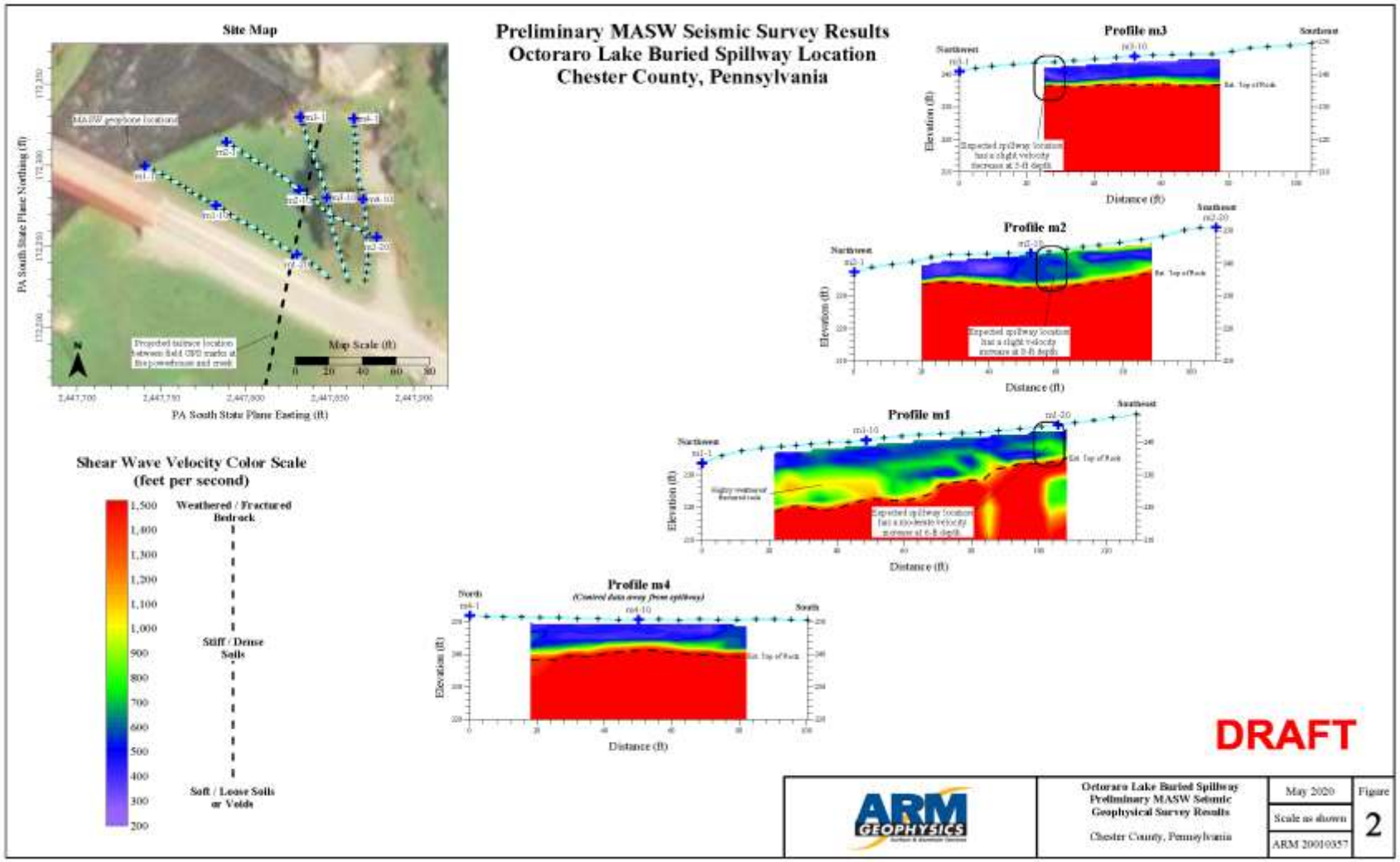


Figure 3b – Two of two potential long term/permanent alternatives – Gazebo in same proposed location but supported by bridge-type structure (profile view)


Site Map
PA South State Plane Northing (ft)
PA South State Plane Easting (ft)
Map Scale (ft)
Resistivity Color Scale
(ohm-meters)
5,120
2,560
1,280
640
320
160
80
40
20
Dry, Sandy Soil / Massive Bedrock / Air-filled Voids
Moist Soil / Moderately Fractured Bedrock
Wet Clayey Soil / Saturated Voids, Shale, Fractured Rock
Resistivity Horizontal
Constant-Depth Slices
(Feet Below Ground Surface)
Depth Slice: 0-3 ft
Depth Slice: 3-6 ft
Depth Slice: 6-10 ft
Depth Slice: 10-15 ft
Depth Slice: 15-20 ft
Preliminary Electrical Resistivity Survey Results
Octoraro Lake Buried Spillway Location
Chester County, Pennsylvania
Resistivity Vertical Profiles 1-3
Vertical Exaggeration 2x
Profile 1
West
East
Elevation (ft)
State Plane Easting (ft)
Profile 2
Profile 3
DRAFT
ARM GEOPHYSICS
Octoraro Lake Buried Spillway
Preliminary Electrical Resistivity
Geophysical Survey Results
Chester County, Pennsylvania
May 2020
Scale as shown
ARM 20010357
Figure
1


Site Map
PA South State Plane Northing (ft)
PA South State Plane Easting (ft)
Map Scale (ft)
Preliminary MASW Seismic Survey Results
Octoraro Lake Buried Spillway Location
Chester County, Pennsylvania
Profile m3
Profile m2
Profile m1
Profile m4
Elevation (ft)
Distance (ft)
Northwest
Southeast
North
South
Shear Wave Velocity Color Scale
(feet per second)
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
Weathered / Fractured Bedrock
Stiff / Dense Soils
Soft / Loose Soils or Voids
DRAFT
ARM GEOPHYSICS
Octoraro Lake Buried Spillway
Preliminary MASW Seismic
Geophysical Survey Results
Chester County, Pennsylvania
May 2020
Scale as shown
ARM 20010357
Figure
2

Hi Andrea,

Dave has been in touch with the geophysical surveyors, ARM Group. They are able to be at the Octoraro site the weeks of May 11, May 18 or June 8. They plan for the work to take one full work day.

The ARM crew would be two people, both wearing face masks. They will be able to generally maintain a 6-foot distancing during the survey and could drive to the site separately, if requested. The project hydrogeologist said that they can accommodate other requests regarding Covid-19 precautions.

Would you like for me to get in touch with Dan Barlow via email and request permission to have ARM access the site?

Erin Redding
Certified Ecologist (Ecological Society of America)

From: Erin Redding
Sent: Friday, March 20, 2020 10:40 AM
To: Dan S. Barlow, Frank G Humbert
Cc: Heather Newton, David Frazier, Smith, Fred, Danucalov, Andrea, Martinek, Michael
Subject: RE: Octoraro Creek Tailrace Investigations

Hi Dan,

Thank you for letting me know. I had not heard this latest news from Pennsylvania. We will be back in touch when construction activities are again permitted.

Best wishes,

Erin Redding
Certified Ecologist (Ecological Society of America)

From: Dan S. Barlow
Sent: Friday, March 20, 2020 10:30 AM
To: Erin Redding; Frank G Humbert
Cc: Heather Newton, David Frazier; Smith, Fred; Danucalov, Andrea; Martinek, Michael
Subject: RE: Octoraro Creek Tailrace Investigations

Good morning Erin,

I hope you are doing well. Last night Governor Wolf issued an order that all businesses that are not "life-sustaining" need to close and there are enforcement actions in place. All construction activities are specifically listed as not being allowed to continue. With that order in mind this work should be postponed until the order is lifted and construction activities can resume. Sorry for the inconvenience.

Stay well,
Dan

Dan Barlow, PE
Plant Operations Engineer

Chester Water Authority
PO Box 467
Chester, PA, 19016-0467

From: Erin Redding
Sent: Friday, March 20, 2020 9:53 AM
To: Frank G Humbert; Dan S. Barlow
Cc: Heather Newton; David Frazier; Smith, Fred; Danucalov, Andrea; Martinek, Michael
Subject: Octoraro Creek Tailrace Investigations

Hello Frank and Dan,

On behalf of Exelon, Gomez and Sullivan has received the attached quote from ARM Geophysics to perform a geophysical assessment at the Octoraro Creek Eel Trapping Facility at Chester Water Authority. (Note that confidential cost information has been removed from this version.)

Could you please review the attached and let us know if you have any questions or concerns? If CWA approves of this effort, please let us know if it is acceptable to have the ARM Geophysics crew at the site on Wednesday March 25 or during the week of March 30. I recall you saying that you would like to be present, but understand that much has changed in the past couple of weeks and you may have new protocols in place.

Thank you,

Erin Redding
Certified Ecologist (Ecological Society of America)

Exelon Generation.

June 2, 2020

Andrea Danucalov
FERC License Compliance Manager
(267) 533-1125
(610) 765-5805 (Fax)
andrea.danucalov@exeloncorp.com

VIA ELECTRONIC FILING

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Conowingo Hydroelectric Project (P-405) and Muddy Run Pumped Storage Project (P-2355) Recreation Site Closures and Modifications Due to COVID-19

Dear Secretary Bose:

On March 18, 2020, Exelon Generation Company, LLC ("Exelon") provided notice to the Federal Energy Regulatory Commission ("FERC") regarding the closure of certain recreation sites associated with FERC Project Nos. P-405 and P-2355 due to the States of Emergency announced in Maryland ("MD") and Pennsylvania ("PA") and Centers For Disease Control ("CDC") guidelines due to COVID-19. The following recreation sites were reopened after amended orders were issued by PA Governor Wolf on May 1, 2020 and MD Governor Hogan on May 6, 2020.

- Fisherman's Park – reopened on May 15, 2020
- Dorsey Park – reopened on May 21, 2020
- Wissler's Run – reopened on May 22, 2020
- Muddy Run Recreation Park – reopened on May 22, 2020
- Glen Cove Marina – reopened on May 22, 2020
- Peach Bottom Marina – reopened on May 22, 2020
    - Note, Peach Bottom Marina was closed in September 2019 to complete maintenance dredging.

State executive orders remain in place in both MD and PA limiting certain activities, including the size of gatherings and travel for essential reasons. In compliance with State executive orders, CDC guidelines and to prevent the spread of COVID-19, amenities may be limited at some recreation sites, such as use of playgrounds, pavilions, boat rentals, bathrooms (portable bathrooms available), amphitheater, observatory and splash pad. COVID-19 protocols for cleaning, worker safety and public safety have been posted at the reopened recreation sites and on social media. All events have been cancelled until further notice.

Three (3) recreation sites remain closed (Conowingo Swimming Pool, Conowingo Visitor's Center, and Muddy Run Visitor's Center), which is consistent with the revised orders issued in PA and MD.

None of the above actions impact any license articles or specific requirements. Exelon will update FERC staff periodically regarding the status of the above-listed closures.

Sincerely,

Andrea Danucalov
FERC License Compliance Manager

cc: Robert Fletcher, FERC, Land Resources

Appendix B:
Weekly Biological Data and Environmental Conditions for Octoraro Creek, 2020

Weekly Eel Catch Data, 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
Octoraro Eels									0	15	64	44	40	20	71	1992	1005	306	22	5	5	2	6
Creek flow (cfs, weekly avg.)									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
Lunar Fraction, (weekly avg.)									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
Water temp (°C, weekly avg.)									20.7	21.4	22.7	22.7	23.8	24.8	25.5	22.5	22.8	23.6	23.5	23.4	21.7	18.6	18.8
Dissolved Oxygen (mg/L, weekly avg.)									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 (in, weekly Avg.)									0.01	0.01	0.49	0	0.13	0.04	0.62	0	0.11	0.25	0.11	0.07	0	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

No collection occurred at Octoraro Creek eel facility until Week 9

No Collection occurred at Conowingo Eel Collection Facility until Week 4

Wk 1: May 1 - May 2
Wk 2: May 3 - May 9
Wk 3: May 10 - May 16
Wk 4: May 17 - May 23
Wk 5: May 24 – May 30
Wk 6: May 31 - June 6
Wk 7: June 7 - June 13
Wk 8: June 14 - June 20
Wk 9: June 21 - June 27
Wk 10: June 28 - July 4
Wk 11: July 5 – July 11
Wk 12: July 12 – July 18
Wk 13: July 19 - July 25
Wk 14: July 26 – August 1
Wk 15: August 2 – August 8
Wk 16: August 9 - August 15
Wk 17: August 16 - August 22
Wk 18: August 23 - August 29
Wk 19: August 30 – September 5
Wk 20: September 6 – September 12
Wk 21: September 13 - September 19
Wk 22: September 20 - September 26
Wk 23: September 27 – October 3

Appendix C:
Weekly Data for 2015-2020

Weekly Eel Catch Data (2015-2019)

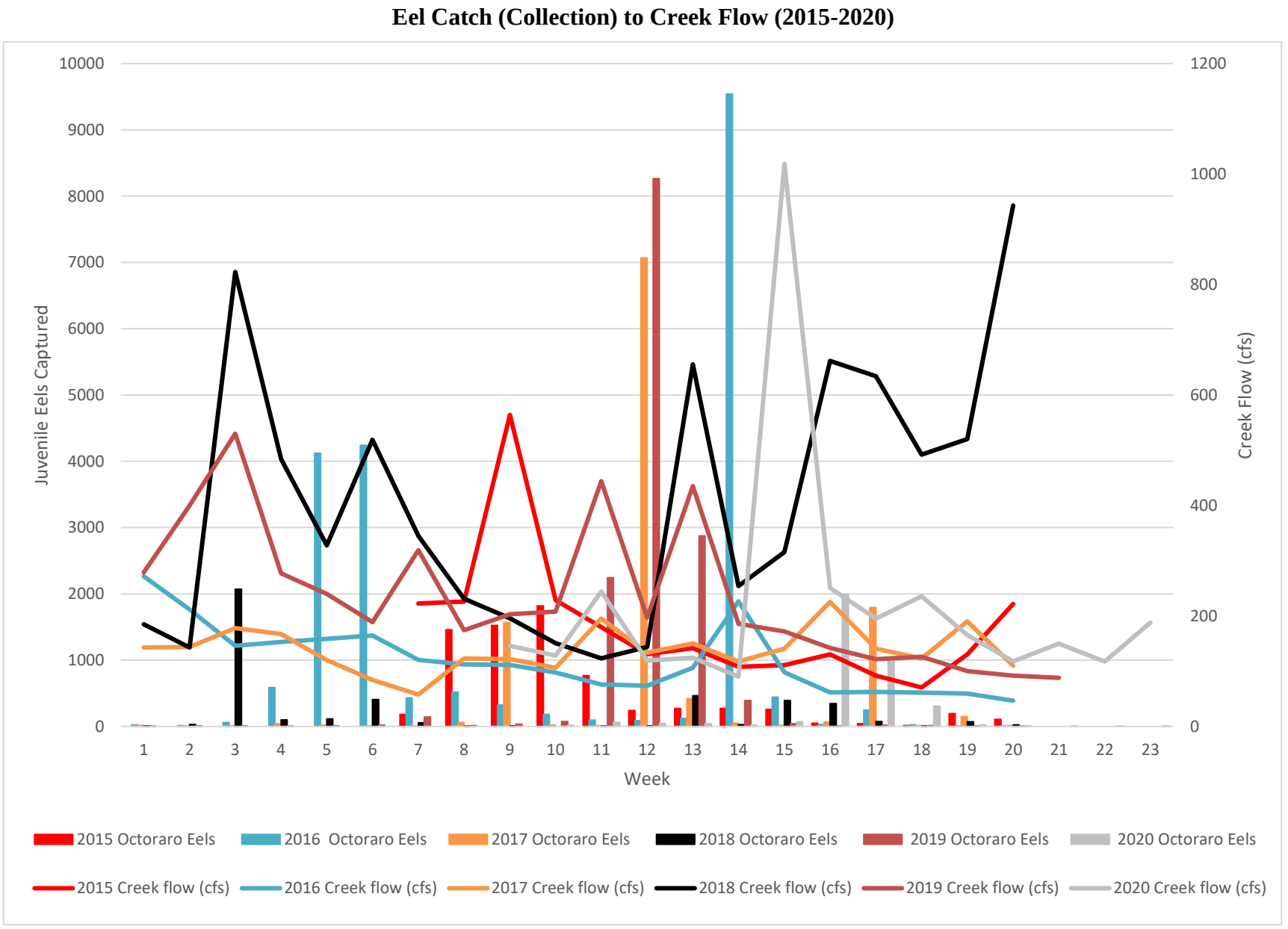
2015 Week							7	8	9	10	11	12	13	14	15	16	17	18	19	20
2015 Octoraro Eels							183	1458	1524	1819	765	240	273	271	258	50	42	13	194	107
2015 Creek flow (cfs)							222.8	225.9	564	228.6	179.7	131	141.9	108.1	111.1	130.4	91.9	70.6	130.6	221.7
2015 Lunar Fraction							0.05	0.48	0.94	0.57	0.05	0.33	0.89	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 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

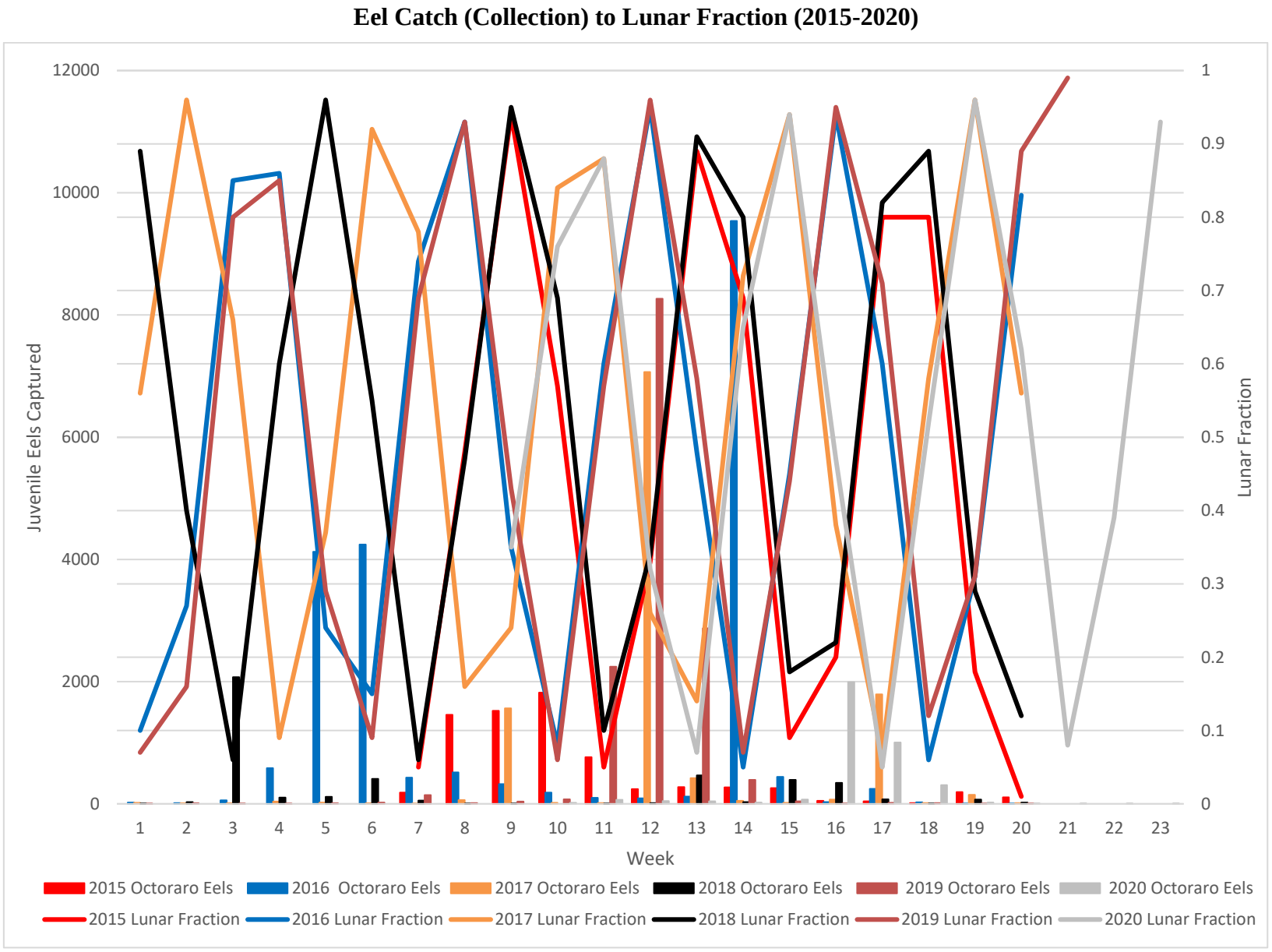
(continued)

(Continued)

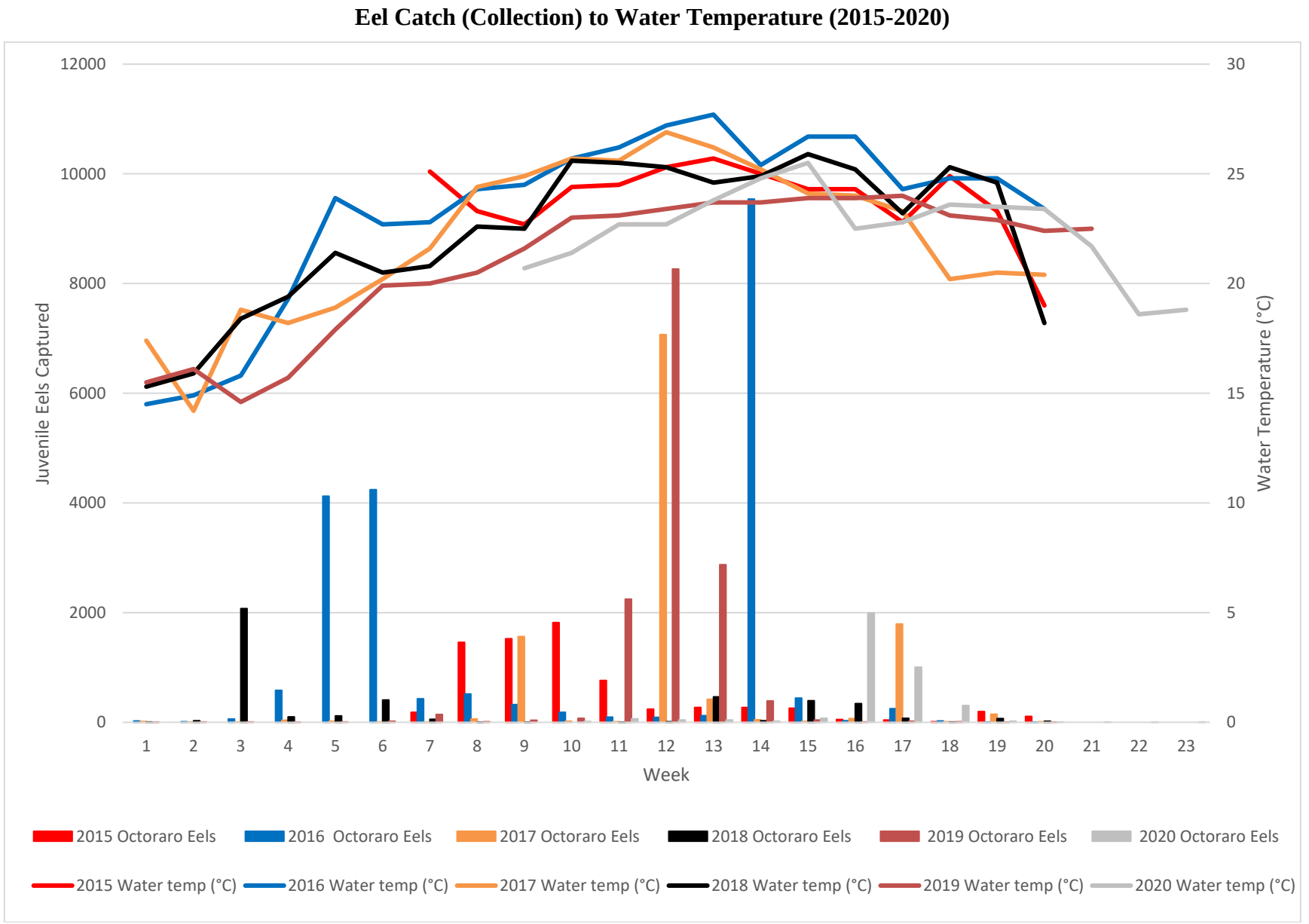
2019 Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
2019 Octoraro Eels	1	9	5	3	9	20	144	12	36	73	2244	8266	2874	391	42	5	19	12	4	1	0
2019 Creek flow (cfs)	279	400	530	277	240	189	319	174	203	208	444	197	435	186	172	142	122	126	100	92	88
2019 Lunar Fraction	0.07	0.16	0.80	0.85	0.29	0.09	0.69	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


Eel Catch (Collection) to Creek Flow (2015-2020)
Juvenile Eels Captured
Creek Flow (cfs)
Week
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
1200
1000
800
600
400
200
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
2015 Octoraro Eels
2016 Octoraro Eels
2017 Octoraro Eels
2018 Octoraro Eels
2019 Octoraro Eels
2020 Octoraro Eels
2015 Creek flow (cfs)
2016 Creek flow (cfs)
2017 Creek flow (cfs)
2018 Creek flow (cfs)
2019 Creek flow (cfs)
2020 Creek flow (cfs)



MUDDY RUN PUMPED STORAGE PROJECT - FERC PROJECT NUMBER 2355



MUDDY RUN PUMPED STORAGE PROJECT - FERC PROJECT NUMBER 2355

Appendix D:
Agency Comments on Draft 2020 American Eel Collection Facility in Octoraro Creek

Mike Martinek

Subject: FW: External: FW: [EXTERNAL] Re: MDNR review of 2020 Conowingo & Octoraro Creek Fish Passage Reports

From: Shawn Seaman -DNR- <shawn.seaman@maryland.gov>
Sent: Monday, December 14, 2020 11:58 AM
To: Tryninewski, Joshua <jtryninews@pa.gov>
Cc: Danucalov, Andrea H (Exelon Power) <Andrea.Danucalov@exeloncorp.com>; Sheila Eyler <Sheila_Eyler@fws.gov>; Aaron Henning <ahenning@srbc.net>; Miller, Jeremy <jeremmille@pa.gov>; Eberts, Ron <reberts@pa.gov>; Emily Zollweg-Horan <emily.zollweg-horan@dec.ny.gov>; Rob Bourdon <robert.bourdon@maryland.gov>; McCorkle, Richard <richard_mccorkle@fws.gov>; Morales, Jesus J <jesus_morales@fws.gov>
Subject: [EXTERNAL] Re: PFBC review of 2020 Conowingo & Octoraro Creek Fish Passage Reports

Andrea,

Maryland DNR has also reviewed these three (3) draft reports and has no comments. Thanks for the opportunity to review.

Due to the COVID-19 pandemic, I am working remotely.

Shawn A Seaman
Power Plant Research Program
Department of Natural Resources
Tawes State Office Building
580 Taylor Ave., B-3
Annapolis, MD 21401
410-260-8662 (office)
443-699-6386 (cell)
shawn.seaman@maryland.gov

dnr.maryland.gov

Power Plant Research Program Website

Click here to complete a three question customer experience survey.

Mike Martinek

Subject: FW: External: FW: FWS Review of Exelon's 2020 Fish Passage Reports

From: Eyler, Sheila <sheila_eyler@fws.gov>
Sent: Monday, December 14, 2020 8:56 AM
To: Danucalov, Andrea H:(Exelon Power) <Andrea.Danucalov@exeloncorp.com>
Cc: Tryninewski, Joshua <jtryninews@pa.gov>; Aaron Henning <ahenning@srbc.net>; Miller, Jeremy <jeremmille@pa.gov>; Ron Eberts <reberts@pa.gov>; Shawn Seaman -DNR- <shawn.seaman@maryland.gov>; Emily Zollweg-Horan <emily.zollweg-horan@dec.ny.gov>; Rob Bourdon <robert.bourdon@maryland.gov>; McCorkle, Richard <richard_mccorkle@fws.gov>; Morales, Jesus J <jesus_morales@fws.gov>
Subject: [EXTERNAL] FWS Review of Exelon's 2020 Fish Passage Reports

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Andrea,

The U.S. Fish and Wildlife Service has reviewed the following fish passage reports for 2020:

1. Muddy Run Pumped Storage Project Conowingo Eel Collection Facility
2. Muddy Run Pumped Storage Project American Eel Collection Facility in Octoraro Creek, 2020
3. Summary of Operations at the Conowingo Dam East Fish Passage Facility Spring 2020
4. Muddy Run Pumped Storage Project Draft 2020 Fish Passage Operating Report

We have no specific comments on these reports.

We appreciate Exelon's efforts to conduct the red-light survey in the Conowingo Eel Collection Facility in 2020. We look forward to working with the company to potentially improve efficiency of the eel collection facility in 2021 based on the results of that evaluation.

Thank you for the opportunity to review the reports. Let me know if you have any questions.

Sheila Eyler
U.S. Fish and Wildlife Service
Mid-Atlantic Fish & Wildlife Conservation Office
177 Admiral Cochrane Dr.
Annapolis, MD 21401
717-387-2117

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Mike Martinek

Subject: FW: External: FW: DEP comments Octoraro and Conowingo Eel Ramp and Conowingo EFL

From: Miller, Jeremy <jeremmille@pa.gov>
Sent: Friday, December 11, 2020 9:10 PM
To: Danucalov, Andrea H:(Exelon Power) <Andrea.Danucalov@exeloncorp.com>; Erin Redding <eredding@gomezandsullivan.com>; Ray Bleistine <rbleistine@normandeau.com>
Cc: Williamson, Scott <scwilliams@pa.gov>; Eberts, Ron <reberts@pa.gov>
Subject: [EXTERNAL] DEP comments Octoraro and Conowingo Eel Ramp and Conowingo EFL

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Andrea,

Thank you for the opportunity to review and comment on the 2020 Octoraro Creek Eel Facility, Conowingo Eel Facility, and Conowingo Dam East Fish Passage Facility reports. DEP has reviewed the reports dated 11/13/2020 and 11/18/2020 and offer the following:

1. Muddy Run Pumped Storage Project American Eel Collection Facility in Octoraro Creek, 2020 FERC Project No 2355- No comments
2. Muddy Run Pumped Storage Project Conowingo Eel Collection Facility FERC Project No 2355- No comments
3. Summary of Operations at the Conowingo Dam East Fish Passage Facility Spring 2020- No comments

Thanks,
Jeremy

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Mike Martinek

Subject: FW: External: FW: [EXTERNAL] Re: PFBC review of 2020 Conowingo & Octoraro Creek Fish Passage Reports

Andrea,

The PFBC has completed its review of 1) *Summary of Operations at the Conowingo Dam East Fish Passage Facility Spring 2020*, 2) *Muddy Run Pumped Storage Project Conowingo Eel Collection Facility*, and 3) *Muddy Run* Pumped Storage Project American Eel Collection Facility in Octoraro Creek, 2020 and has no comments to provide. Thank you for the opportunity to review these reports and for Exelon's continued efforts and participation in shad and eel restoration to the Susquehanna River.

Regards,

-Josh

Joshua D. Tryninewski

Anadromous Fish Restoration Unit

Pennsylvania Fish & Boat Commission

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