

2021 BLACK DUCK MONITORING REPORT

**Penobscot River
Penobscot River, Maine**

Prepared for:
**United States District Court
District of Maine**

Prepared by:
**Wood
Environment & Infrastructure, Inc.**
511 Congress Street
Portland, ME 04101

April 14, 2021

Project No. 3617207486



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LIST OF ACRONYMS

%	percent
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
DIFW	Department of Inland Fisheries and Wildlife
EB	equipment blank
EPA	Environmental Protection Agency
Estuary	Penobscot River Estuary
Eurofins	Eurofins Frontier Global Sciences
FSP	Field Sampling Plan
MDL	method detection limit
ME	Maine
MS	matrix spike
MSD	matrix spike duplicate
Parties	Plaintiffs Maine People's Alliance and Natural Resources Defense Council and the Defendant, Mallinckrodt US LLC
QC	field quality control
QAPP	Quality Assurance Project Plan
RL	reporting limit
RPD	relative percent difference
SOP	standard operating procedure
TestAmerica	Eurofins TestAmerica
TOC	total organic carbon
Wood	Wood Environment & Infrastructure Solutions, Inc

EXECUTIVE SUMMARY

Wood implemented black duck monitoring in January 2021 based on recommendations in the Phase III Engineering Report (Amec Foster Wheeler, 2018), in accordance with the *Draft Field Sampling Plan (FSP), 2020 Sediment, Water Quality, and Aquatic Biota Monitoring* for the Penobscot River (Wood, 2020b). The accompanying data report details the sampling effort and presents the results for American black duck blood and co-located sediment samples collected in January 2021.

1.0 INTRODUCTION

Beginning in 1967, a chlor-alkali plant located in Orrington, Maine released mercury into the Penobscot River. The amount of mercury released annually decreased between 1970 and 1982 and decreased further when the plant was closed in 2000. The Penobscot River, in northern Maine (ME), is the second-largest river in New England. The Penobscot River Estuary (Estuary) has a surface area of approximately 35 square miles and extends 22 miles southward from Bangor, ME to about Searsport, ME, with Penobscot Bay extending further southward (**Figure 1-1**).

1.1 Purpose, Scope, and Objectives

This report describes the results of American black duck blood and co-located sediment samples collected for mercury and ancillary physical parameters in the Estuary in 2021.

The Penobscot River Mercury Study monitored mercury concentration in sediment, water, and biota in the Estuary between 2006 and 2014. The Phase III Engineering Study by Wood Environment & Infrastructure Solutions, Inc (Wood) (formerly Amec Foster Wheeler) extended this monitoring in a modified form in 2016 and 2017, the most recent years of data collection. In the Final Phase III Engineering Study Report, Wood recommended that “long-term monitoring begin in the near future and be undertaken every three years” (Amec Foster Wheeler, 2018) hereinafter referred to as the Phase III Engineering Report.

Plaintiffs Maine People’s Alliance and Natural Resources Defense Council and the Defendant, Mallinckrodt US LLC (collectively, the Parties) agree generally that some form of long-term monitoring is necessary, but the Parties’ experts differ on the precise details of a long-term monitoring program. In the interest of compromise and to facilitate the continuity of the data in the Estuary, the Parties agreed to an interim monitoring plan for 2020. The Parties prepared The Penobscot River 2020 Monitoring Plan (Maine People’s Alliance et al., 2020) in January 2020.

Sampling of sediment, surface water, and aquatic biota occurred in 2020, and results were reported in the Sediment, Water Quality and Aquatic Biota Monitoring Report (Wood, 2021). American black duck sampling occurred in January 2021, consistent with winter sampling of black ducks in prior monitoring events. The analytical results of the black duck blood and co-located sediment samples from 2021 are presented herein.

1.2 Report Organization

- Section 1.0 - Introduction presents the purpose and organization of this 2021 Black Duck Monitoring Report.
- Section 2.0 - Approach, Methods, and Criteria summarizes the process, plan, criteria, and rationale for sampling.
- Section 3.0 – 2021 Sediment and Black Duck Analytical Results presents the analytical results.

-
- Section 4.0 - References provides reference information for the documents cited within this report.

2.0 APPROACH, METHODS, AND CRITERIA

Wood developed and implemented the 2021 Black Duck Monitoring in accordance with the following documents:

- Wood Work Order – 2020 Sediment, Water Quality, and Biota Monitoring (Wood, 2020a)
- 2020 Draft Field Sampling Plan (Wood, 2020b)
- 2020 Draft Quality Assurance Project Plan (Wood, 2020c)
- 2020 Health and Safety Plan (Wood, 2020d)

The sample locations for black duck collection were consistent with previous annual monitoring identified in the 2012, 2016, and 2017 monitoring reports. Permission was obtained from property owners for land access by the Maine Department of Inland Fisheries and Wildlife (ME DIFW) as necessary. The appropriate state and federal permits for collection of black ducks were obtained from ME DIFW and United States Fish and Wildlife Service, and are presented in **Appendix A**. A Health and Safety Plan (Wood, 2020d) was implemented to provide for the safety of on-Site workers and to protect the public during field work.

Laboratories that were selected to perform project-related analyses are as follows:

Sediment

- Eurofins Frontier Global Sciences of Tacoma, Washington (Eurofins) performed both low level mercury analysis (Environmental Protection Agency [EPA] methods 1631B) and methyl mercury analysis (EPA method 1630)
- Eurofins TestAmerica of Pittsburgh, Pennsylvania (TestAmerica) performed total organic carbon (TOC) analysis (Lloyd-Kahn method)

Black Duck

- Eurofins performed total mercury analysis (EPA method 1631B)

2.1 Adjustments to 2021 Monitoring Program

During the course of the 2021 monitoring program, there were no adjustments made to the program which differed from the scope presented in the *Draft FSP for 2020 Sediment, Water Quality, and Aquatic Biota Monitoring* (Wood, 2020b).

2.2 2020 Sediment Sample Collection and Processing Summary

Wood collected samples at three sediment monitoring locations in January 2021, and these were co-located with black duck collection locations. **Table 2-1** presents a list of the sediment stations and coordinates where the co-located sediment cores were collected as part of the black duck sampling during 2021. **Figure 1-1** presents the locations of the three co-located sediment and black duck monitoring stations. Sediment samples from Frenchman Bay were collected as the reference location for black duck monitoring.

Field Data Records for each collected sediment core are presented in **Appendix B-1**. Sediment was collected from the proposed sampling stations, and no significant deviations from the scope

of work were encountered. Photo logs presenting sediment samples are included as **Appendix B-2**.

Sediment core collection and processing were conducted in accordance with Standard Operating Procedures (SOPs) S-6, S-7, S-7A, S-19, S-20, and S-23 included in **Appendix C** and can also be found in the Quality Assurance Project Plan (QAPP [Wood, 2020c]).

Sediment samples were collected using a direct-push coring tube sampler from intertidal locations accessed by foot at low tide. Decontamination of equipment between samples was consistent with SOP S-17 included in **Appendix C**. For all methods, coring employed a 0.5-foot to 1.0-foot penetration depth target and generally recovered at least 0.5-foot of sediment. Cores were often pushed beyond 0.5-foot depth to ensure sufficient sediment recovery.

2.2.1 Sediment Push-Core Collection Procedures

Samples were collected at sampling stations in the intertidal zone using a push-core sampling device. The device was pushed a minimum of 0.5 feet into the substrate, twisted to separate the sample in the liner from the remaining substrate materials, and the liner extracted. In some instances, the liner was extracted by digging it out of the ground by hand to maximize sample recovery. Samples were secured in a cooler with wet ice until processing was performed.

2.2.2 Sediment Sample Processing Summary

Core samples were prepared and processed in the field station. Select locations were sampled in duplicate. For duplicate core locations, one core was opened and used to record the lithology and sectioned for analysis, while the second core was sectioned for analysis only. Each core sample was sectioned as follows:

- 0.0–0.1 foot,
- 0.1–0.3 foot, and
- 0.3–0.5 foot.

Field personnel followed the QAPP (Wood, 2020c) guidance on sediment sample container requirements, sample labeling and tracking requirements, and packaging and shipping. Sediment samples were analyzed as indicated in **Table 2-1**. Field Quality Control (QC) samples were collected in accordance with procedures identified in the QAPP.

The field duplicates were collected at a frequency of 10 percent (%) (1 in every 10) for samples submitted to the analytical laboratory for the analysis of the target compounds. The field duplicates are used as replicate samples for consistency and comparability of the analytical process. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) material was collected and submitted for laboratory equipment check of analytical performance. The extra sediment volume was provided to the laboratory for MS/MSD at a frequency of 5% (1 in every 20) for samples submitted to the analytical laboratory for the analysis of the target compounds. The MS/MSD recovery and precision are indications of a laboratory's ability to successfully recover an analyte in the matrix of a specific sample or closely related sample matrices. An equipment blank (EB), or rinsate blank, was collected at a rate of 1 per sample event to evaluate effectiveness of rinsing

procedures used during sample collection. The EB was collected using laboratory-provided de-ionized water after the equipment was decontaminated, following SOP S-17 in **Appendix C**.

2.3 2021 Black Duck Sample Collection and Processing

Black duck sample locations were consistent with those presented in the FSP (Wood, 2020b). The study locations are generally denoted in the sample identification using the acronyms ES: estuary; MM: Mendall Marsh; and FRB: Frenchman Bay. **Figure 2-2** depicts the black duck sample locations.

2.3.1 Black Duck Sample Collection

American black ducks were captured by wire traps and rocket nets consistent with SOP S-10 in **Appendix C**, with the aid of ME DIFW biologist, Kelsey Sullivan. Wire traps with a trap box on the back side were baited with corn and left open at collection sites to accustom the ducks to finding food at the site, allowing free access into and out of the baited trap. After ducks began to willingly enter the open wire traps to eat the bait, the wire traps were rebaited and set. Set wire traps have a narrow entry that allows the ducks to enter, but not exit, the trap. When ducks were present in the wire trap, the sample crew “herded” the birds into the trap box. The ducks were removed from the trap box by a trained bird handler, taking care not to injure or stress the bird, and then placed in travel crates. The birds were immediately taken to a location to process and release the birds near the capture location, as soon as possible, to minimize stress. Captured birds were processed similarly whether captured by wire trap or rocket net.

The rocket net was accordion folded along one edge, concealed with seaweed, and attached to the ground. The projectiles were metal cylinders with threaded caps on one end and ports for gasses to escape on the opposite end. The cylinder projectiles were launched using black powder and an electric charge controlled by the operator in the blind using a trigger box. When triggered, the net was launched over the ducks, capturing the ducks. Once captured, the ducks were transferred out of the nets and into travel crates as soon as possible to minimize injury and stress. The crated birds were taken to the processing area. Captured birds were processed similarly whether captured by wire trap or rocket net.

The positions of the wire traps or rocket nets at sample locations were recorded using a Trimble R1 GPS unit paired with an electronic data collector to provide sub-meter accuracy. Coordinates were visually verified on base maps in ArcGIS 10.4 (ESRI 2015). Sample coordinates, sample IDs, and the analytical matrix are presented on **Table 2-2**. Sample identification numbers and date of collection were recorded on the field data record (**Appendix B-3**). Photographs of duck sampling activities are presented in **Appendix B-4**.

2.3.2 Black Duck Processing Procedures

Ducks were banded, weighed, aged, and sex determined prior to release. Blood samples were collected from American black ducks consistent with SOP S-10 in **Appendix C**. One leg of the duck was wiped with alcohol prior to the use of the 27-gauge needle to collect blood. Duck blood was collected from the vein near the ankle using 70 μ L capillary tubes. Capillary tubes were capped when full of blood or when blood stopped flowing. The target sample was three to five capillary tubes of blood per duck.

Once sufficient blood was obtained from the vein, pressure was briefly applied to stop the bleeding if necessary. The capillary tubes were placed in a labeled plastic tube for each bird sample and placed on dry ice for transport to Eurofins. Samples were analyzed for mercury by EPA Method 1631e (**Table 2-2**). Blood sample processing was conducted in accordance with the QAPP (Wood, 2020c) SOPs S-19 and S-20 included in **Appendix C**.

2.3.3 Black Duck Sample Quantities

A total of 35 black ducks were collected from three sample locations. See **Table 2-2** for sample locations and quantities.

2.4 Laboratory Data Deliverables and Data Validation

Full analytical data deliverable packages, equivalent to a Contract Laboratory Program data package, for co-located sediment and black duck are provided in **Appendices D-1** and **D-2**, respectively. The analytical data packages consist of forms summarizing sample analytical results, QC blank results, raw data, and forms summarizing QC measurement parameters including the sample preparation logs. Data packages were provided by the laboratories in portable document format and an electronic data deliverable.

Wood utilized the laboratory analytical data packages to perform data validation using a technical review for accuracy and completeness. Stage 2B data validation was performed for 90% of project data and Stage 3 validation for the remaining 10% of analytical laboratory deliverable packages. The Stage 2B validation included review of quality control information and instrument-related QC. The Stage 3 validation included review of raw data and supporting documentation. The Stage 3 level of validation allowed the validator to uncover any potential data quality issues pertaining to laboratory analysis. If severe non-compliant QC issues were identified, the laboratory was required to correct the problem. No severe non-compliant QC issues were identified for the laboratory to correct. The data validation process is outlined in Worksheets #35, #36, and #37 in the QAPP. The Wood validators identified potential data quality issues pertaining to laboratory analysis and either required actions by the laboratory to correct or qualified the data accordingly. Data validation reports for black duck and co-located sediment data are provided in **Appendix E**.

The project laboratory reported results using a combination of two detection limits including the reporting limit (RL) and the method detection limit (MDL). Results for compounds that are not detected in samples are reported as U qualified results at the RL. Positive detections between the MDL and RL are qualified as estimated (J) by the laboratory.

The following qualifiers as applied during data validation or reported by the laboratory that are included in the final data set:

J = The reported concentration is considered an estimated value

U = The target compound was not detected above the RL

Validation reason codes were applied to results associated with QC measurements outside project QC goals. The following data validation reason codes were applied to one or more sample results:

Sediment:

LR = Laboratory replicate relative percent difference (RPD) limit exceeded

Black Duck:

MS-H = MS and/or MSD recovery high

MS-L = MS and/or MSD recovery low

MS-RPD = MS/MSD RPD limit exceeded

Data validation uncovered that a MS/MSD was not requested or performed for the laboratory for methyl mercury analysis in sediment. While this is a deviation from the project QAPP, it does not warrant qualification of data.

No sediment or black duck analytical results were rejected because of validation and all results are considered useable (see **Appendix E**).

2.4.1 Data Usability

The data usability assessment consists of a review of any field program issues, sample collection issues, field measurement issues, or laboratory data quality issues that were identified during the field sampling event and subsequent data review process. Deviations to the work plan were discussed in Section 2.1. None of the analytical results for sediment or black duck were rejected because of validation, and the results are considered useable (see **Appendix E**). An evaluation of the major precision, accuracy, representativeness, and completeness deficiencies is discussed below.

Precision and Accuracy

Sediment

TOC data in one sediment sample was qualified due to laboratory replicate imprecision.

Biota

Mercury data in 16 black duck blood samples were qualified due to low bias based on low MS recoveries and imprecision between the MS and MSD. Nine of these samples had elevated concentrations of mercury and the potential bias and imprecision does not impact data usability, but 7 results are detections below the RL and, while usable, may be considered imprecise and biased low.

Mercury data in 18 black duck blood samples were qualified due to high bias based on high MS recoveries. All these samples had elevated concentrations of mercury and the potential bias does not impact data usability.

Representativeness and Completeness

To be considered representative, sampling and analysis of sediment and biota must be conducted so that it provides appropriate spatial and temporal coverage of the potential exposure media (sediment and biota) identified in the *Final Phase III Engineering Study*

Report (Amec Foster Wheeler, 2018), and subsequently modified in the *Draft FSP for 2020 Sediment, Water Quality, and Aquatic Biota Monitoring* (Wood, 2020b). All proposed sediment locations were collected as planned. All biota locations were sampled but one location (the reference location) did not yield the targeted number of samples, as indicated in **Table 2-2**. Wood considers the samples collected to be representative.

3.0 2021 SEDIMENT AND BLACK DUCK ANALYTICAL RESULTS

Analytical results of the 2021 black duck monitoring are presented below.

3.1 2021 Sediment Monitoring Analytical Results

Sediment monitoring analytical results for total mercury, total methyl mercury, and TOC are included in **Table 3-1**, and presented on **Figures 3-1** through **Figure 3-3**.

3.2 2021 Black Duck Monitoring Analytical Results

Black duck monitoring analytical results for total mercury are included in **Table 3-2**. Black duck monitoring results are presented on **Figure 3-1** through **Figure 3-3**.

4.0 REFERENCES

Amec Foster Wheeler, 2018, *Final Phase III Engineering Study Report, Penobscot River Phase III - Engineering Study, Penobscot River, Maine*. Amec Foster Wheeler Environment & Infrastructure, Inc. September, 2018.

ESRI, 2015. ArcGIS 10.4. Redlands, California: Environmental Systems Research Institute.

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Wood, 2020a. *Work Order-2020 Sediment, Water Quality, and Aquatic Biota Monitoring, Penobscot River, Penobscot River, Maine*. Wood Environment & Infrastructure Solutions, Inc. May 2020.

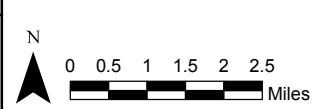
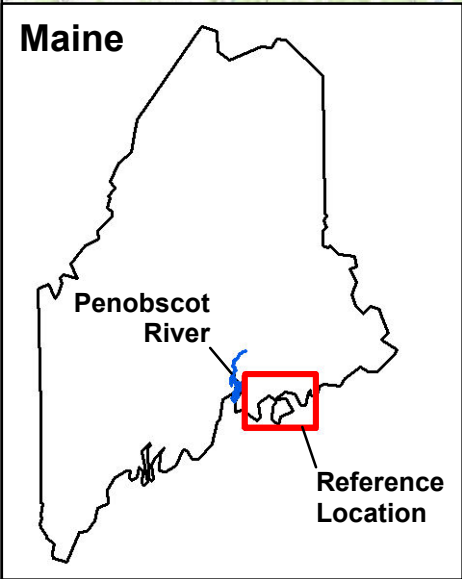
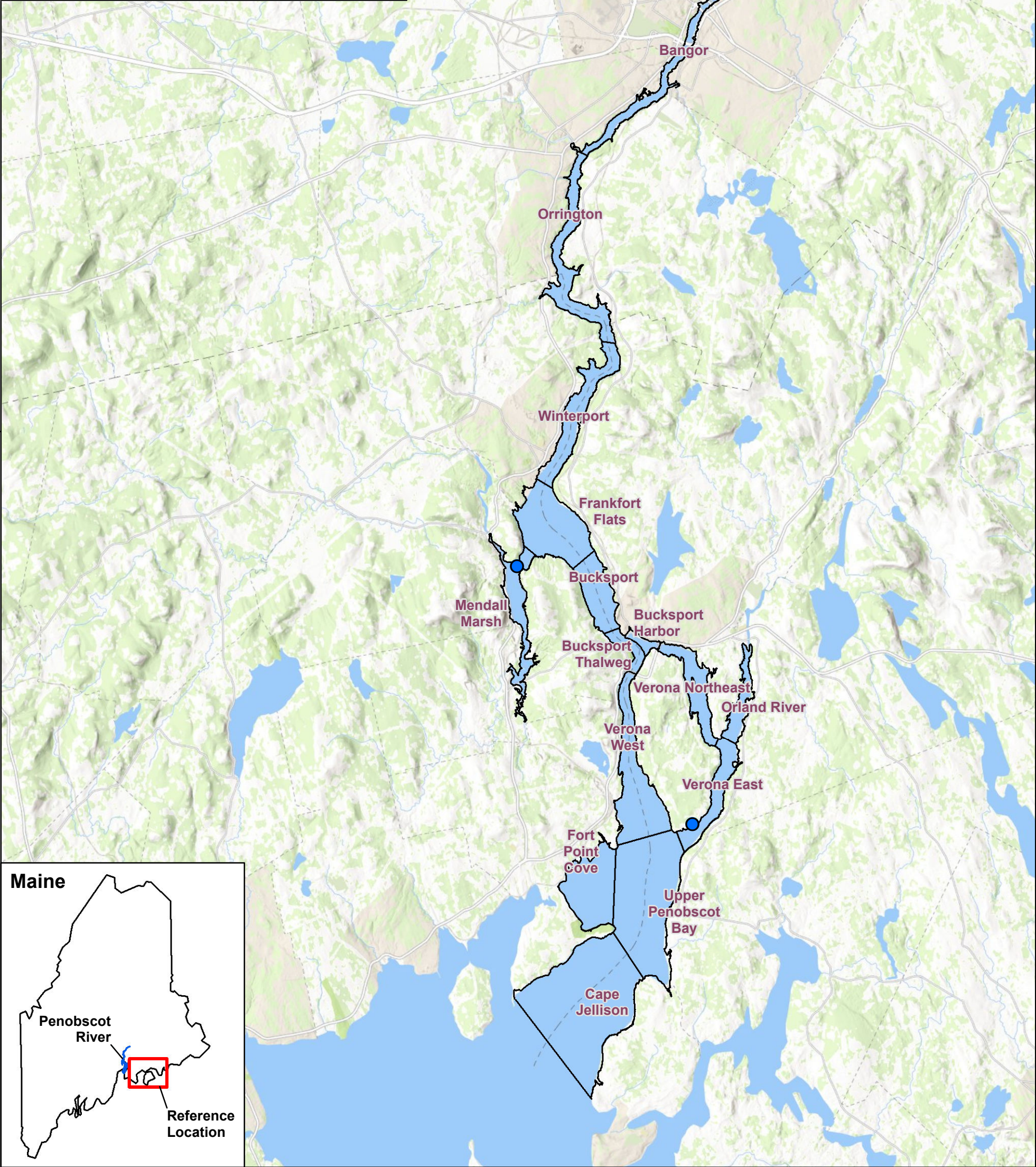
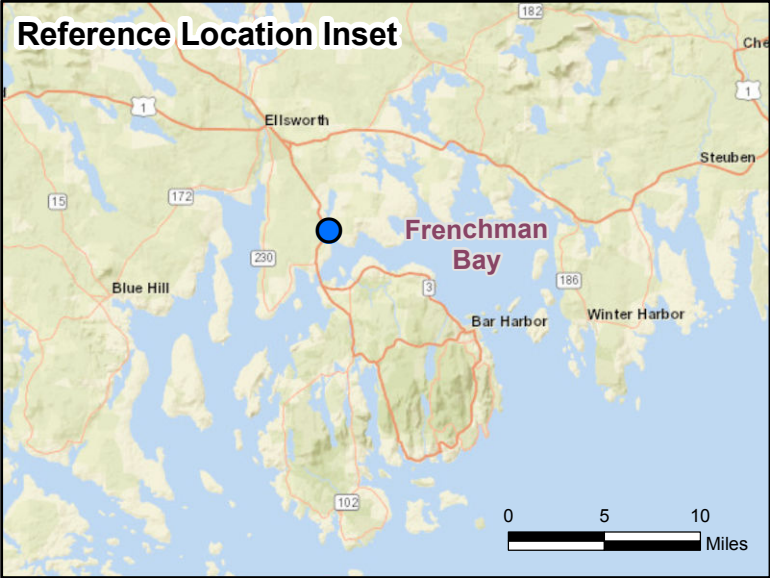
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Wood, 2020c. *Draft Quality Assurance Project Plan (QAPP), 2020 Sediment, Water Quality, and Aquatic Biota Monitoring, Penobscot River, Penobscot River, Maine*. Wood Environment & Infrastructure Solutions, Inc. May 2020.

Wood, 2020d. *Health and Safety Plan (HASP), 2020 Sediment, Water Quality, and Aquatic Biota Monitoring, Penobscot River, Penobscot River, Maine*. Wood Environment & Infrastructure Solutions, Inc. May 2020.

Wood, 2021. *2020 Sediment, Water Quality and Aquatic Biota Monitoring Report, Penobscot River, Penobscot River, Maine*. Wood Environment & Infrastructure Solutions, Inc. March 2021.

FIGURES



- Symbol Key**
- Black Duck and Sediment Sample Location
 - ▭ Official Study Reaches
 - County Borders

Figure 1-1
Site Location and Black Duck
Monitoring Locations – Overview

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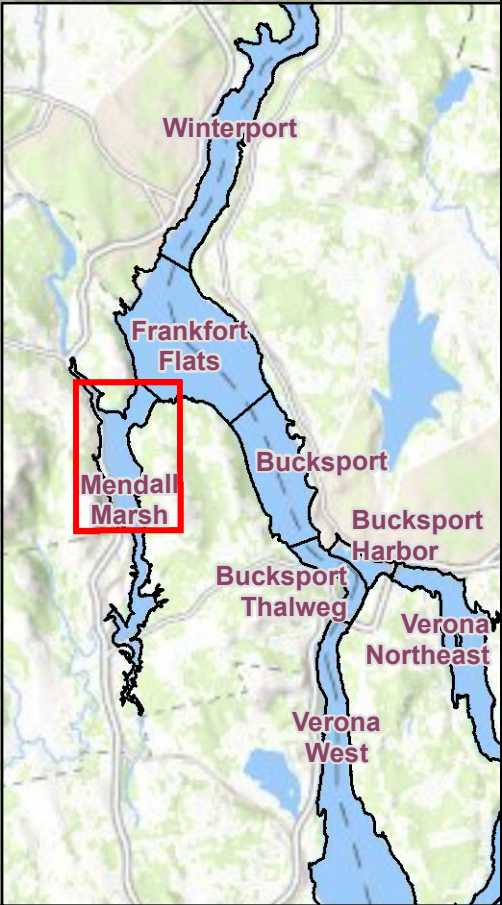
Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

MMBKD-01a	
Black Duck Individual	Hg ng/g
01	804 J
02	385 J
03	795 J
04	404 J
05	592 J
06	236 J
07	223 J
08	290 J
09	434 J
10	551 J
11	255 J
12	390 J
13	271 J
14	232 J
15	281 J

MMBKD-01a			
Core Depth feet	Hg ng/g	MeHg ng/g	TOC mg/kg
0.0 - 0.1	360	<14.9 U	94,000 J
0.1 - 0.3	149	<9.5 U	54,000
0.3 - 0.5	28.7 J	(-)	34,000

Sediment	
Mercury [Hg] (ng/g)	Methyl Mercury [MeHg] (ng/g)
ND	ND
< 200	< 2
200 - 450	2 - 4.5
450 - 750	4.5 - 7.5
750 - 1,000	7.5 - 15
1,000 - 2,200	15 - 25
2,200 - 5,000	25 - 50
> 5,000	> 50

Black Duck	
Mercury [Hg] (ng/g)	
ND	
< 100	
100 - 200	
200 - 500	
500 - 1,000	
> 1,000	



(-) Interval not analyzed for MeHg
J - Estimated value
TOC - Total Organic Carbon
U or ND - Non Detect
(mg/kg) milligrams/kilogram
(ng/g) nanograms/gram

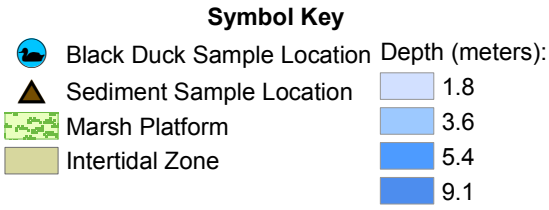


Figure 3-1
2021 Sediment and Black Duck
Analytical Results – Mendall Marsh

2021 Black Duck Monitoring Report
Penobscot River, Maine

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Document: P:\Projects\USDC - Penobscot River\4.0_Deliverables\4.5_Databases\GIS\Preliminary Work\MXD\Black Duck 2021\BD_2021_Verona.mxd PDF: P:\Projects\USDC - Penobscot River\2020 Monitoring-3617207486\4.0_Deliverables\4.1_Reports\2021 Black Duck Report\Figures\Figure 3-2 - South Verona.pdf 03-26-2021 12:45 PM brian.peters

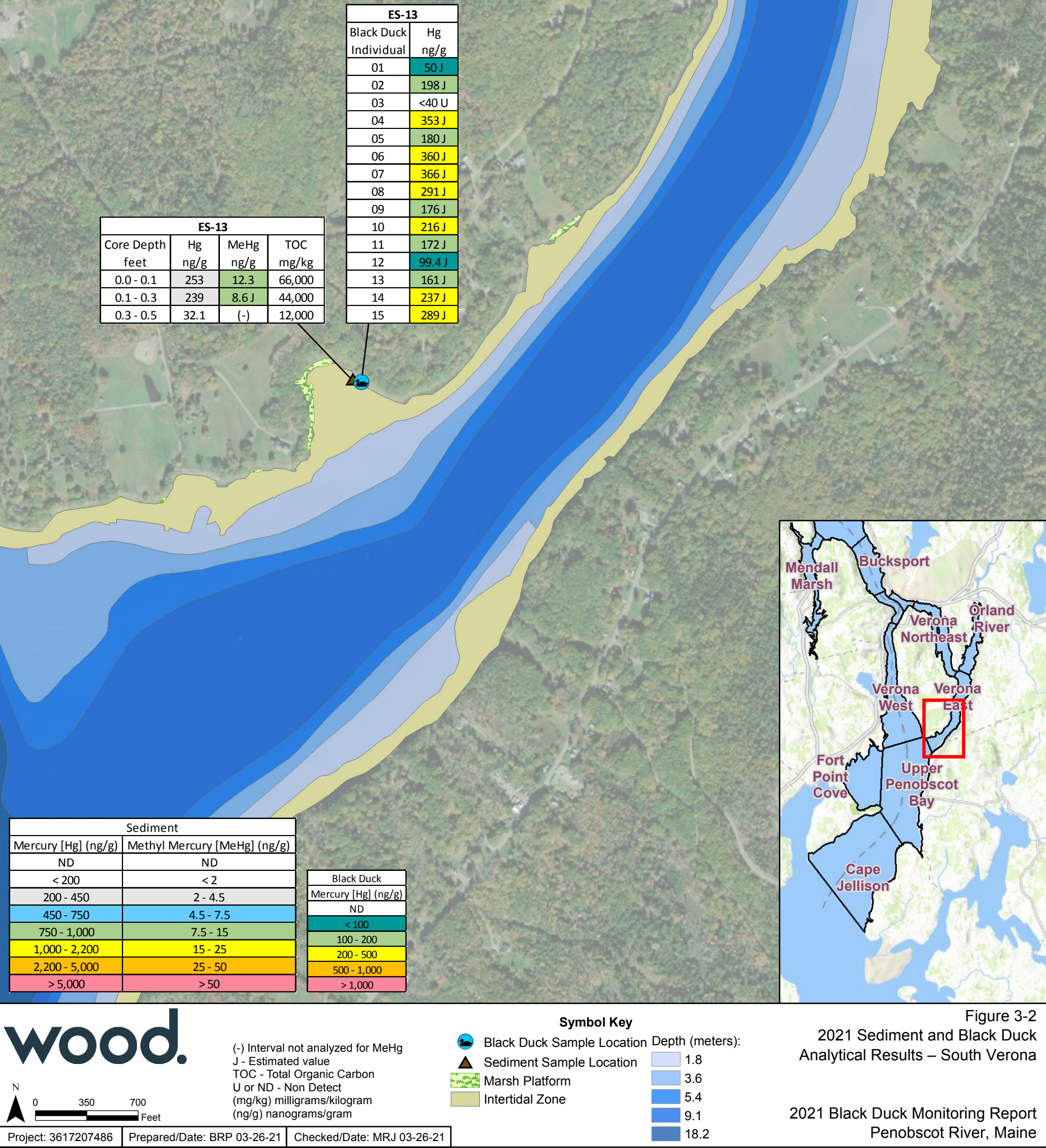


Figure 3-2
2021 Sediment and Black Duck
Analytical Results – South Verona

2021 Black Duck Monitoring Report
Penobscot River, Maine

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FRB-02	
Black Duck Individual	Hg ng/g
01	99.8 J
02	58.4 J
03	75.8 J
04	69.5 J
05	87.7 J

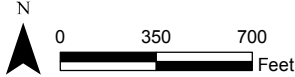
FRB-02			
Core Depth feet	Hg ng/g	MeHg ng/g	TOC mg/kg
0.0 - 0.1	8.94 J	<7.8 U	21,000
0.1 - 0.3	16.9 J	<7.4 U	24,000
0.3 - 0.5	14.2 J	(-)	22,000

Sediment	
Mercury [Hg] (ng/g)	Methyl Mercury [MeHg] (ng/g)
ND	ND
< 200	< 2
200 - 450	2 - 4.5
450 - 750	4.5 - 7.5
750 - 1,000	7.5 - 15
1,000 - 2,200	15 - 25
2,200 - 5,000	25 - 50
> 5,000	> 50

Black Duck
Mercury [Hg] (ng/g)
ND
< 100
100 - 200
200 - 500
500 - 1,000
> 1,000



(-) Interval not analyzed for MeHg
J - Estimated value
TOC - Total Organic Carbon
U or ND - Non Detect
(mg/kg) milligrams/kilogram
(ng/g) nanograms/gram



- Symbol Key**
- Black Duck Sample Location
 - Sediment Sample Location

Figure 3-3
2021 Sediment and Black Duck
Analytical Results – Frenchman Bay
Reference Location

2021 Black Duck Monitoring Report
Penobscot River, Maine

TABLES

TABLE 2-1
2021 SEDIMENT COORDINATES AND ANALYTICAL MATRIX

2021 Duck Monitoring Report
Penobscot River, Maine

Sample Stations	Sample Date	Location Sampled		Sample ID ¹	Parameter, Method, & Preservation			Co-located Biota
					Total Hg	Total MeHg	TOC	
		Longitude	Latitude		1631B	1630	Lloyd-Kahn	
					Dry Ice	Dry Ice	Wet Ice	
MMBKD-01	1/25/2021	-68.860439	44.598564	MMBKD-01_012521_SED_00-01 to MMBKD-01_012521_SED_03-05 ²	3	2	3	x
FRB-02	1/26/2021	-68.356887	44.462989	FRB-02_012621_SED_00-01 to FRB-02_012621_SED_03-05 ³	3	2	3	x
ES-13	1/26/2021	-68.771783	44.504933	ES-13_012621_SED_00-01 to ES-13_012621_SED_03-05	3	2	3	x

Notes:

¹See the Sample Nomenclature Standard Operating Procedure for Sample ID generation; each core sliced to intervals 0.0-0.1, 0.1-0.3, and 0.3-0.5 feet

²Duplicate sample on MMBKD-01_012521_SED_01-03

³MS/MSD collected on FRB-02_021621_SED_03-05

Hg = Mercury

MeHg = Methylmercury

TOC = Total Organic Carbon

ID = identification

MS/MSD = Matrix Spike/Matrix Spike Duplicate

TABLE 2-2
2021 BLACK DUCK SAMPLE COORDINATES AND ANALYTICAL MATRIX

2021 Duck Monitoring Report
Penobscot River, Maine

Sample Stations	Sample Date	Location Sampled		Sample ID ¹	Parameter, Method, & Preservation	Co-located Sediment
					Total Hg	
		Longitude	Latitude		1631B	
					Dry Ice	
MMBKD-01	1/25/2021	-68.860439	44.598564	MMBKD-01_012521_ABD_01_BL to MMBKD-01_012521_ABD_15_BL ²	15	x
FRB-02	1/26/2021 and 1/27/2021	-68.356887	44.462989	FRB-02_012621_ABD_01_BL to FRB-02_012721_ABD_05_BL ³	5	x
ES-13	1/30/2021	-68.771783	44.504933	ES-13_013021_ABD_01_BL to ES-13_013021_ABD_15_BL ⁴	15	x

Notes:

¹See the Sample Nomenclature Standard Operating Procedure for Sample ID generation; up to 15 individual birds sampled from trap

²MS/MSD collected on MMBKD-01_012521_ABD_07_BL

³MS/MSD collected on FRB-02_012621_ABD_01_BL

⁴MS/MSD collected on ES-13_013021_ABD_14_BL

Hg = Mercury

ID = Identification

MS/MSD = Matrix Spike/Matrix Spike Duplicate

**TABLE 3-1
2021 SEDIMENT MONITORING ANALYTICAL RESULTS**

**2021 Duck Monitoring Report
Penobscot River, Maine**

Location	Sample Date	Sample Time	1-Mar	Top Depth	Bottom Depth	Parameter Units QC Code	Total Mercury		Total Methyl Mercury		Total Organic Carbon	
							ng/g		ng/g		mg/kg	
							Final Result	Final Qual	Final Result	Final Qual	Final Result	Final Qual
MMBKD-01	1/25/2021	15:25	MMBKD-01_012521_SED_00-01	0	1	FS	360		14.9	U	94,000	J
	1/25/2021	15:35	MMBKD-01_012521_SED_01-03	1	3	FS	149		9.5	U	54,000	
	1/25/2021	12:00	MMBKD-01_012521_SED_01-03_DUP	1	3	FD	142		10.2	U	56,000	
	1/25/2021	15:40	MMBKD-01_012521_SED_03-05	3	5	FS	28.7	J			34,000	
ES-13	1/26/2021	18:45	ES-13_012621_SED_00-01	0	1	FS	253		12.3		66,000	
	1/26/2021	18:55	ES-13_012621_SED_01-03	1	3	FS	239		8.6	J	44,000	
	1/26/2021	19:05	ES-13_012621_SED_03-05	3	5	FS	32.1				12,000	
FRB-02	1/26/2021	15:00	FRB-02_012621_SED_00-01	0	1	FS	8.94	J	7.8	U	21,000	
	1/26/2021	15:15	FRB-02_012621_SED_01-03	1	3	FS	16.9	J	7.4	U	24,000	
	1/26/2021	15:30	FRB-02_012621_SED_03-05	3	5	FS	14.2	J			22,000	

Notes:

¹See the Sample Nomenclature Standard Operating Procedure for Sample ID generation; each core sliced to intervals 0.0-0.1, 0.1-0.3, and 0.3-0.5 feet

ID = Identification

FS = Field Sample

FD = Field Duplicate

SED = Sediment sample

Qual = Qualifier

J = The reported concentration is considered an estimated value

U = The target compound was not detected above the reporting limit

ng/g = nanograms per gram

mg/kg = milligrams per kilogram

QC = Quality Control

TABLE 3-2
2021 BLACK DUCK MONITORING ANALYTICAL RESULTS

2021 Duck Monitoring Report
Penobscot River, Maine

Location	Sample Date	Sample Time	Sample Number	Parameter Units Field Sample ID ¹	Total Mercury	
					ng/g	
					Final Result	Qual Result
MMBKD-01	1/25/2021	9:51	01	MMBKD-01_012521_ABD_01_BL	804	J
	1/25/2021	10:08	02	MMBKD-01_012521_ABD_02_BL	385	J
	1/25/2021	10:30	03	MMBKD-01_012521_ABD_03_BL	795	J
	1/25/2021	10:40	04	MMBKD-01_012521_ABD_04_BL	404	J
	1/25/2021	10:51	05	MMBKD-01_012521_ABD_05_BL	592	J
	1/25/2021	11:07	06	MMBKD-01_012521_ABD_06_BL	236	J
	1/25/2021	11:20	07	MMBKD-01_012521_ABD_07_BL	223	J
	1/25/2021	11:30	08	MMBKD-01_012521_ABD_08_BL	290	J
	1/25/2021	11:38	09	MMBKD-01_012521_ABD_09_BL	434	J
	1/25/2021	11:45	10	MMBKD-01_012521_ABD_10_BL	551	J
	1/25/2021	11:54	11	MMBKD-01_012521_ABD_11_BL	255	J
	1/25/2021	12:04	12	MMBKD-01_012521_ABD_12_BL	390	J
	1/25/2021	12:17	13	MMBKD-01_012521_ABD_13_BL	271	J
	1/25/2021	12:28	14	MMBKD-01_012521_ABD_14_BL	232	J
	1/25/2021	12:33	15	MMBKD-01_012521_ABD_15_BL	281	J
ES-13	1/30/2021	16:34	01	ES-13_013021_ABD_01_BL	50	J
	1/30/2021	16:45	02	ES-13_013021_ABD_02_BL	198	J
	1/30/2021	16:54	03	ES-13_013021_ABD_03_BL	40	U
	1/30/2021	17:04	04	ES-13_013021_ABD_04_BL	353	J
	1/30/2021	17:14	05	ES-13_013021_ABD_05_BL	180	J
	1/30/2021	17:22	06	ES-13_013021_ABD_06_BL	360	J
	1/30/2021	17:29	07	ES-13_013021_ABD_07_BL	366	J
	1/30/2021	17:40	08	ES-13_013021_ABD_08_BL	291	J
	1/30/2021	17:52	09	ES-13_013021_ABD_09_BL	176	J
	1/30/2021	17:58	10	ES-13_013021_ABD_10_BL	216	J
	1/30/2021	18:06	11	ES-13_013021_ABD_11_BL	172	J
	1/30/2021	18:16	12	ES-13_013021_ABD_12_BL	99.4	J
	1/30/2021	18:25	13	ES-13_013021_ABD_13_BL	161	J
	1/30/2021	18:36	14	ES-13_013021_ABD_14_BL	237	J
	1/30/2021	18:45	15	ES-13_013021_ABD_15_BL	289	J
FRB-02	1/26/2021	10:45	01	FRB-02_012621_ABD_01_BL	99.8	J
	1/26/2021	11:15	02	FRB-02_012621_ABD_02_BL	58.4	J
	1/27/2021	12:20	03	FRB-02_012721_ABD_03_BL	75.8	J
	1/27/2021	12:40	04	FRB-02_012721_ABD_04_BL	69.5	J
	1/27/2021	12:55	05	FRB-02_012721_ABD_05_BL	87.7	J

Notes:

¹See the Sample Nomenclature Standard Operating Procedure for Sample ID generation; up to 15 individual birds sampled from a location

ID = Identification

ABD = American Black Duck

BL = Blood

Qual = Qualifier

J = The reported concentration is considered an estimated value

U = The target compound was not detected above the reporting limit

ng/g = nanograms per gram