NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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PFAS Analyses of Fish Collected in 2020 from Seneca Lake

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ABSTRACT

The Analytical Services Unit (ASU) at Hale Creek Field Station (HCFS) conducted chemical analyses on a total of 62 fish samples collected from Seneca Lake. Samples were analyzed for total mercury, total PCBs, selected organochlorine pesticides, and selected per- and polyfluoroalkyl substances (PFAS). Results of the mercury, PCBs, and organochlorine pesticides analyses were reported separately in ASU Report 21-35. This report consists of the analytical data associated with 34 samples that were analyzed for selected PFAS. Maximum contaminant levels found in the samples were 1.36 ng/g for perfluoropentanoic acid (PFPeA), 1.47 ng/g for perfluorooctanoic acid (PFOA), 9.26 ng/g for perfluorononanoic acid (PFNA), 7.09 ng/g for perfluorodecanoic acid (PFDA), 7.06 ng/g for perfluoroundecanoic acid (PFUnA), 2.80 ng/g for perfluorododecanoic acid (PFDoA), 34.7 ng/g for perfluorooctanesulfonic acid (PFOS), and 3.34 ng/g for perfluorooctane sulfonamide (PFOSA). Levels were below detection limits for perfluorobutanoic acid (PFBA), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), perfluorobutanesulfonic acid (PFBS), and perfluorohexane sulfonate (PFHxS).

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SAMPLE INFORMATION

This report consists of results of analyses of 34 of the 62 fish samples collected in 2020 from Seneca Lake for the Toxic Substance Monitoring Program. The fish collected were 52 Lake Trout (LT) and 10 Yellow Perch (YP). Fish analyzed for PFAS were 24 LT and 10 YP. The fish were collected by Brad Hammers of NYSDEC Region 8. Collection records for the samples are attached at the end of this report.

LABORATORY METHODS

The ASU analyzed 34 samples for selected PFAS. The ASU Lab Numbers assigned to the samples were 20-0021-H through 20-0072-H and 20-0331-H through 20-0340-H. The ASU program name assigned to the samples was Seneca L-2020.

Sample preparation. Samples were transported to HCFS where they were stored at -20°C or colder. The samples were prepared for analysis in accordance with HCFS Standard Operating Procedure (SOP) *PrepLab4*. All samples were dissected, ground, and homogenized at HCFS.

PFAS analysis. Samples were analyzed for selected PFAS by LC/MS/MS using isotopic dilution [HCFS SOP HC-511 (PFAS)]. Prior to analysis, each sample was extracted with 0.05 N KOH in methanol followed by ENVI-Carb and SPE cleanup steps. All samples were analyzed quantitatively for 13 PFAS (9 carboxylic acids: PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnA, and PFDoA; 3 sulfonic acids: PFBS, PFHxS, and PFOS; 1 sulfonamide: PFOSA). Samples were also qualitatively monitored for an additional 27 PFAS (perfluorotridecanoic acid (PFTrA), perfluorotetradecanoic acid (PFTeA), perfluoropenanesulfonic acid (PFPeS), perfluoroheptanesulfonic acid (PFHpS), perfluorononanesulfonic acid (PFNS), perfluorodecane sulfonic acid (PFDS), perfluorododecane sulfonic acid (PFDOS), 4:2 fluorotelomer sulfonic acid (4:2 FTS), 6:2 fluorotelomer sulfonic acid (6:2 FTS), 8:2 fluorotelomer sulfonic acid (8:2 FTS), n-methylperfluoro-1-octansulfonamide (N-MeFOSA), n-ethylperfluoro-1-octanesulfonamide (N-EtFOSA), n-methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA), n-ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA), 2-(n-methylperfluoro-1-octanesulfonamido)-ethanol (N-MeFOSE), 2-(n-ethylperfluoro-1-octanesulfonamido)-ethanol (N-EtFOSE), 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPO-DA), sodium dodecafluoro-3H-4,8-dioxanonanoate (ADONA), potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS), potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS), 3-perfluoropropyl propanoic acid (3:3 FTCA), 3-perfluoropentyl propanoic acid (5:3 FTCA), 3-perfluoroheptyl propanoic acid (7:3 FTCA), potassium perfluoro(2-ethoxyethane) sulfonate (PFEESA), perfluoro-4-oxapentanoic acid (PFMPA), perfluoro-5-oxahexanoic acid (PFMBA) and perfluoro-3,6-dioxaheptanoic acid (NFDHA)). The method was developed using guidance from the Department of Defense and Department of Energy consolidated Quality Systems Manual for Environmental Laboratories Version 5.3 and EPA method 533: Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid-Chromatography/Tandem Mass Spectrometry.

LABORATORY RESULTS

Results are contained in the following tables:

- Table 1: Sample collection and preparation information;
- Table 2: Concentrations of PFAS in ng/g wet weight.

In each table, the rows are ordered by lab number.

Concentrations were below the detection limit for PFBA, PFHxA, PFHpA, PFBS, and PFHxS.

Concentrations were below the detection limit for all qualitatively monitored PFAS, except for the following:

- 6:2 FTS was detected above 20 ng/g in Sample 22-0044-H.
- NFDHA was detected above 10 ng/g in nine samples (22-0044-H, 22-0046-H, 22-0052-H, 22-0054-H, 22-0060-H, 22-0062-H, 22-0069-H, 22-0071-H, and 22-0072-H).

All sample information and results are also contained in file “REP 22-38 (Seneca L-20).xlsx”, formatted in Excel. General information and a data dictionary for the tables and the Excel file are shown in Appendix A. The quality control procedures and quality control results for these analyses are described in Appendix B. The method detection limit (MDL) for each analyte is listed in Table B1 (Appendix B).

Table 1: Sample Collection and Preparation Information in Fish Collected from Seneca Lake in 2020

LABNO	TAGNO	SPP	SDATE	LOCATION	AGE	SEX	PREP	LENMM	WGTG	PROGRAM
20-0022-H	2012102	LT	20200714	Seneca Lake	6	F	SF	560	1503	Seneca L-2020
20-0025-H	2012105	LT	20200714	Seneca Lake	4	F	SF	420	567	Seneca L-2020
20-0031-H	2012111	LT	20200714	Seneca Lake	5	F	SF	475	907	Seneca L-2020
20-0034-H	2012114	LT	20200714	Seneca Lake	6	M	SF	550	1446	Seneca L-2020
20-0035-H	2012115	LT	20200714	Seneca Lake	4	M	SF	375	425	Seneca L-2020
20-0039-H	2012119	LT	20200714	Seneca Lake	4	M	SF	520	964	Seneca L-2020
20-0040-H	2012120	LT	20200714	Seneca Lake	4	M	SF	500	1134	Seneca L-2020
20-0041-H	2012121	LT	20200714	Seneca Lake	9	M	SF	705	3090	Seneca L-2020
20-0042-H	2012122	LT	20200714	Seneca Lake	6	F	SF	595	1899	Seneca L-2020
20-0044-H	2012124	LT	20200714	Seneca Lake	4	M	SF	555	1729	Seneca L-2020
20-0045-H	2012125	LT	20200715	Seneca Lake	4	M	SF	512	1126	Seneca L-2020
20-0046-H	2012127	LT	20200715	Seneca Lake	7	M	SF	620	2265	Seneca L-2020
20-0048-H	2012129	LT	20200715	Seneca Lake	5	F	SF	598	1963	Seneca L-2020
20-0049-H	2012130	LT	20200715	Seneca Lake	5	M	SF	498	1206	Seneca L-2020
20-0050-H	2012131	LT	20200715	Seneca Lake	4	M	SF	480	1180	Seneca L-2020
20-0052-H	2012133	LT	20200715	Seneca Lake	4	M	SF	456	927	Seneca L-2020
20-0053-H	2012134	LT	20200715	Seneca Lake	5	M	SF	560	1832	Seneca L-2020
20-0054-H	2012135	LT	20200715	Seneca Lake	8	M	SF	664	2570	Seneca L-2020
20-0060-H	2012141	LT	20200729	Seneca Lake	5		SF	588	1885	Seneca L-2020
20-0062-H	2012143	LT	20200729	Seneca Lake	7		SF	710	3338	Seneca L-2020
20-0067-H	2012148	LT	20200729	Seneca Lake	6		SF	624	2654	Seneca L-2020
20-0069-H	2012150	LT	20200729	Seneca Lake	5		SF	516	1222	Seneca L-2020
20-0071-H	2012152	LT	20200730	Seneca Lake	8		SF	678	2939	Seneca L-2020
20-0072-H	2012153	LT	20200730	Seneca Lake	8		SF	626	2135	Seneca L-2020
20-0331-H	2012154	YP	20200915	Seneca Lake	5		SF	300	355	Seneca L-2020
20-0332-H	2012155	YP	20200915	Seneca Lake	4		SF	257	214	Seneca L-2020
20-0333-H	2012156	YP	20200915	Seneca Lake	4		SF	255	213	Seneca L-2020
20-0334-H	2012157	YP	20200915	Seneca Lake	4		SF	234	125	Seneca L-2020
20-0335-H	2012158	YP	20200915	Seneca Lake	6		SF	362	592	Seneca L-2020
20-0336-H	2012159	YP	20200915	Seneca Lake	7		SF	271	211	Seneca L-2020
20-0337-H	2012160	YP	20200915	Seneca Lake	7		SF	360	706	Seneca L-2020
20-0338-H	2012161	YP	20200916	Seneca Lake	5		SF	314	437	Seneca L-2020
20-0339-H	2012162	YP	20200916	Seneca Lake	6		SF	276	305	Seneca L-2020
20-0340-H	2012126	YP	20200715	Seneca Lake	7		SF	312	455	Seneca L-2020

Note: See Appendix A for general information and a data dictionary for this table.

Table 2: Concentrations of PFAS in ng/g in Fish Collected from Seneca Lake in 2020

LABNO	TAGNO	SPP	PFAS												
			PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnA	PFDoA	PFBS	PFHxS	PFOS	PFOSA
20-0022-H	2012102	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	2.14	-2.00
20-0025-H	2012105	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	6.02	-2.00
20-0031-H	2012111	LT	-2.00	-1.00	-1.00	-1.00	1.47	6.10	3.67	2.81	-1.00	-1.00	-2.00	15.5	-2.00
20-0034-H	2012114	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	5.03	-2.00
20-0035-H	2012115	LT	-2.00	-1.00	-1.00	-1.00	-1.00	6.76	5.56	5.35	1.30	-1.00	-2.00	19.1	-2.00
20-0039-H	2012119	LT	-2.00	-1.00	-1.00	-1.00	-1.00	2.06	1.64	1.59	-1.00	-1.00	-2.00	7.14	2.42
20-0040-H	2012120	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	2.38	3.30	1.22	-1.00	-2.00	9.27	-2.00
20-0041-H	2012121	LT	-2.00	-1.00	-1.00	-1.00	-1.00	5.82	4.93	4.02	-1.00	-1.00	-2.00	17.6	-2.00
20-0042-H	2012122	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	2.76	-2.00
20-0044-H	2012124	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	4.93	-2.00
20-0045-H	2012125	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	5.09	-2.00
20-0046-H	2012127	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	4.03	3.34
20-0048-H	2012129	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	2.36	-2.00
20-0049-H	2012130	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.22	1.02	-1.00	-1.00	-2.00	7.58	-2.00
20-0050-H	2012131	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	2.92	-2.00
20-0052-H	2012133	LT	-2.00	-1.00	-1.00	-1.00	-1.00	9.26	6.13	5.16	1.42	-1.00	-2.00	23.4	-2.00
20-0053-H	2012134	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	-2.00	-2.00
20-0054-H	2012135	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	-2.00	-2.00
20-0060-H	2012141	LT	-2.00	1.36	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	-2.00	-2.00
20-0062-H	2012143	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	3.24	-2.00
20-0067-H	2012148	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	-2.00	-2.00
20-0069-H	2012150	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	-2.00	-2.00
20-0071-H	2012152	LT	-2.00	1.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	4.36	-2.00
20-0072-H	2012153	LT	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	2.17	-2.00
20-0331-H	2012154	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	2.96	-2.00
20-0332-H	2012155	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.63	1.66	-1.00	-1.00	-2.00	7.23	-2.00
20-0333-H	2012156	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	3.50	-2.00
20-0334-H	2012157	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	-2.00	-2.00
20-0335-H	2012158	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.23	1.14	-1.00	-1.00	-2.00	2.37	-2.00
20-0336-H	2012159	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	3.76	-2.00
20-0337-H	2012160	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.80	1.73	-1.00	-1.00	-2.00	4.72	3.14
20-0338-H	2012161	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	2.34	-2.00
20-0339-H	2012162	YP	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-2.00	-2.00	-2.00
20-0340-H	2012126	YP	-2.00	-1.00	-1.00	-1.00	-1.00	3.99	7.09	7.06	2.80	-1.00	-2.00	34.7	-2.00

Note: See Appendix A for general information and a data dictionary for this table.

APPENDIX A

General information for using tables and electronic file: "REP 22-38 (Seneca L-20).xlsx"

1. Chemical concentrations are reported in ng/g (ppb) wet weight.
2. The results are reported to no more than three significant figures.
3. A negative concentration indicates the concentration was below the MDL. The number following the negative sign is the MDL.

Data dictionary for tables and electronic file: "REP 22-38 (Seneca L-20).xlsx"

1. LABNO - unique sample lab number assigned at Hale Creek Field Station (character)
2. TAGNO - sample identifier assigned at time of collection and contained in collection records (character)
3. SPP - species code; LT=Lake Trout and YP=Yellow Perch. (character)
4. SDATE - date sample was collected; format is YYYYMMDD (numeric)
5. LOCATION - location where sample was collected (character)
6. AGE - age of fish in years, if determined (numeric)
7. SEX - sex of fish, if determined; M=male; F=female (character)
8. PREP - preparation method; SF=standard fillet, W=whole fish; W-HV=whole fish minus the head and viscera (character)
9. LENMM - fish length in mm; mean length in mm, if sample is composite (numeric)
10. WGTG - fish weight in g; total weight in g, if sample is composite (numeric)
11. PROGRAM - program name assigned by Hale Creek Field Station (character)
12. MAXLEN - maximum fish length in mm, if sample is composite (numeric)
13. MINLEN - minimum fish length in mm, if sample is composite (numeric)
14. SDLEN - standard deviation of fish length in mm, if sample is composite (numeric)
15. MAXWGT - maximum fish weight in g, if sample is composite (numeric)
16. MINWGT - minimum fish weight in g, if sample is composite (numeric)
17. SDWGT - standard deviation of fish weight in g, if sample is composite (numeric)
18. NOANLY - number of individuals in sample; if NOANLY is greater than 1, then sample is composite (numeric)
19. PFBA - perfluorobutanoic acid (numeric)
20. PFPeA - perfluoropentanoic acid (numeric)
21. PFHxA - Perfluorohexanoic acid (numeric)
22. PFHpA - Perfluoroheptanoic acid (numeric)
23. PFOA - Perfluorooctanoic acid (numeric)
24. PFNA - Perfluorononanoic acid (numeric)
25. PFDA - Perfluorodecanoic acid (numeric)
26. PFUnA - Perfluoroundecanoic acid (numeric)
27. PFDoA - Perfluorododecanoic acid (numeric)
28. PFBS - Perfluorobutanesulfonic acid (numeric)
29. PFHxS - Perfluorohexanesulfonic acid (numeric)
30. PFOS - Perfluorooctanesulfonic acid (numeric)
31. PFOSA - Perfluorooctane sulfonamide (numeric)

APPENDIX B

Quality control for PFAS

The quality control for PFAS included analyses of, at minimum, one reference material sample, one laboratory control sample, one laboratory duplicate, and one method blank for every extraction batch of up to 20 samples. For the reported analyses, there were five method blanks, five reference material samples, five laboratory control samples, and five duplicate samples. The reference materials were three IRMM 427 and two SRM 1947. The reference material samples, laboratory control samples, and laboratory duplicate results were used to determine accuracy and precision of the fish tissue sample results. The method blanks (laboratory water used during the analysis procedure) were analyzed to determine potential contamination of fish tissue samples. Criteria for control limits for PFAS were based on recommended control limits in EPA method 533: Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid-Chromatography/Tandem Mass Spectrometry. Control limits for accuracy were percent recovery = 70-130 percent. The control limit for precision was the relative percent difference (RPD) of laboratory duplicate analyses ≤ 30 percent. The MDL was used to assess potential contamination.

The control limit for accuracy was determined to be exceeded for an analyte in the study if the percent recovery from the laboratory control sample or reference material was outside 70-130 percent (see Table B1).

The control limit for precision was determined to be exceeded for an analyte in the study if the RPD of the laboratory duplicate was greater than 30 percent (see Table B1).

All analytes in the method blanks were below the MDL. The MDLs for the analytes are listed in Table B1.

Summary of quality control

All quality assurance was within control limits for accuracy, precision, and potential contamination in ASU Report 22-38, except for the following:

- One Method Blank (22-MB-028) for PFOSA at 2.74 ppb. The acceptance limit is <2 ppb.
- One Laboratory Control Spike (22-LCS-034) for PFHxS at 161% recovery. The acceptable range is 70-130% recovery.
- Sample 20-0022-H for isotopic dilution standard recovery for MPFDA at 33.7% and M7PFUnA at 32.1%. The acceptable range is 40-150% recovery.
- Sample 20-0031-H for isotopic dilution standard recovery for M7PFUnA at 38.61%. The acceptable range is 40-150% recovery.
- Sample 20-0041-H for isotopic dilution standard recovery for MPFDA at 39.2% and M7PFUnA at 36.1%. The acceptable range is 40-150% recovery.

Table B1: Percent Recovery, Precision, and MDLs of Per- and Polyfluoroalkyl Substances in Five Laboratory Control Spikes, Five Reference Material Samples, and Five Pairs of Laboratory Duplicates Analyzed at Hale Creek Field Station for Seneca Lake 2020.

ANALYTE	LABORATORY CONTROL SAMPLE		REFERENCE MATERIAL *		LABORATORY DUPLICATES **		MDL (ng/g)
	MEAN %R	RSD (%)	MEAN %R	RSD (%)	# of PAIRS	MEAN RPD %	
PFBA	104%	6.24	-	-	-	-	2
PFPeA	104%	6.10	-	-	-	-	1
PFHxA	104%	7.20	-	-	-	-	1
PFHpA	104%	6.66	-	-	-	-	1
PFOA	103%	7.10	-	-	1	8.14	1
PFNA	103%	5.90	-	-	1	1.64	1
PFDA	103%	6.90	-	-	4	7.23	1
PFUnA	104%	6.32	-	-	4	7.01	1
PFDoA	101%	8.67	-	-	-	-	1
PFBS	100%	6.16	-	-	-	-	1
PFHxS	110%	26.9	-	-	-	-	2
PFOS	101%	8.33	121%	5.00	4	9.40	2
PFOSA	93.7%	3.50	-	-	-	-	2

*Reference material for PFOS was IRMM 427 (N=3) and SRM 1947 (N=2).
**Laboratory duplicate RPDs were only used to calculate a mean RPD when the result for each sample in the pair was greater than the MDL.

APPENDIX C: Chain of Custody and Collection Records

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, Brad Hammons (Print Name), of NYS DEC Region 8 (Print Business Address) collected the following on 7/14,15,16,29,30 (Date), 2020 from Seneca Lake (Water Body) in the vicinity of Various Locations throughout Lake (Landmark, Village, Road, etc.) Town of Various, in Various County.

Item(s) 52 Lake Trout 2012101 – 2012125, 2012127 – 2012153

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on 7/14,15,16,29,30, 2020.

I, Brad Hammons, received the above mentioned sample(s) on the date specified and assigned identification number(s) 2012101 – 2012125, 2012127 – 2012153 to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

Signature: [signature] Date: 8/18/20

SECOND RECIPIENT (Print Name): Steven Robb	TIME & DATE: 11:30 8/26/20	PURPOSE OF TRANSFER: Transport to Hale Creek
SIGNATURE: [signature]	UNIT: Fisheries	
THIRD RECIPIENT (Print Name):	TIME & DATE:	PURPOSE OF TRANSFER:
SIGNATURE:	UNIT:	
FOURTH RECIPIENT (Print Name):	TIME & DATE:	PURPOSE OF TRANSFER:
SIGNATURE:	UNIT:	
RECEIVED IN LABORATORY BY (Print Name): KYLE STEVENS	TIME & DATE: 11:30 08/26/2020	REMARKS:
SIGNATURE: [signature]	UNIT: HCFS	
LOGGED IN BY (Print Name): Chloe Armato	TIME & DATE: 1:13pm 09/09/2020	ACCESSION NUMBERS: 20-0021-H → 20-0072-H
SIGNATURE: [signature]	UNIT: HCFS	

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES
FISH COLLECTION RECORD

Project and Site Name: Seneca Lake Standard Gang Netting — DEC Region: 8

Collections made by (names): Brad Hammers

Sampling Method: ☐Electrofishing ■Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other

Preservation Method: ■Freezing ☐Other — Notes:

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (mm)	WEIGHT (g)	REMARKS
20-0021-H	2012101	Lake Trout	7/14/20	86	5	F AD	555	1956	
20-0022-H	2012102	Lake Trout	7/14/20	86	6	F AD	560	1503	
20-0023-H	2012103	Lake Trout	7/14/20	86	6	M AD	635	2381	
20-0024-H	2012104	Lake Trout	7/14/20	86	4	F IM	385	482	
20-0025-H	2012105	Lake Trout	7/14/20	86	4	F IM	420	567	
20-0026-H	2012106	Lake Trout	7/14/20	86	11	F AD	660	3118	
20-0027-H	2012107	Lake Trout	7/14/20	86	10	M AD	615	2608	
20-0028-H	2012108	Lake Trout	7/14/20	86	4	M IM	440	822	
20-0029-H	2012109	Lake Trout	7/14/20	86	6	M AD	545	1361	
20-0030-H	2012110	Lake Trout	7/14/20	91	10	F AD	635	2977	
20-0031-H	2012111	Lake Trout	7/14/20	91	5	F AD	475	907	
20-0032-H	2012112	Lake Trout	7/14/20	91	4	M IM	460	907	
20-0033-H	2012113	Lake Trout	7/14/20	91	7	M AD	593	1871	
20-0034-H	2012114	Lake Trout	7/14/20	88	6	M AD	550	1446	
20-0035-H	2012115	Lake Trout	7/14/20	88	4	M IM	375	425	

richter: revised 2011

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES
FISH COLLECTION RECORD

Project and Site Name: Seneca Lake Standard Gang — DEC Region: 8

Collections made by (names): Brad Hammers

Sampling Method: ☐Electrofishing ■Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other

Preservation Method: ■Freezing ☐Other — Notes:

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (MM)	WEIGHT (g)	REMARKS
✓ 20-0036-H	2012116	Lake Trout	7/14/20	88	4	M AD	480	1049	
✓ 20-0037-H	2012117	Lake Trout	7/14/20	88	4	F IM	510	1191	
✓ 20-0038-H	2012118	Lake Trout	7/14/20	88	4	F IM	475	964	
✓ 20-0039-H	2012119	Lake Trout	7/14/20	88	4	M AD	520	964	
✓ 20-0040-H	2012120	Lake Trout	7/14/20	88	4	M IM	500	1134	
✓ 20-0041-H	2012121	Lake Trout	7/14/20	88	9+	M AD	705	3090	
✓ 20-0042-H	2012122	Lake Trout	7/14/20	88	6	F AD	595	1899	
✓ 20-0043-H	2012123	Lake Trout	7/14/20	90	11	F AD	670	2892	
✓ 20-0044-H	2012124	Lake Trout	7/14/20	90	4	M AD	555	1729	
✓ 20-0045-H	2012125	Lake Trout	7/15/20	11	4	M AD	512	1126	
✓ 20-0046-H	2012127	Lake Trout	7/15/20	11	7	M AD	620	2265	
✓ 20-0047-H	2012128	Lake Trout	7/15/20	11	4	M IM	510	1210	
✓ 20-0048-H	2012129	Lake Trout	7/15/20	11	5	F M	598	1963	
✓ 20-0049-H	2012130	Lake Trout	7/15/20	11	5	M IM	498	1206	
✓ 20-0050-H	2012131	Lake Trout	7/15/20	12	4	M IM	~~597~~ 480 weight checked	~~1736~~ 1180g ✓ NJS	

richter: revised 2011

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES
FISH COLLECTION RECORD

Project and Site Name: Seneca Lake Standard Gang Netting — DEC Region: 8

Collections made by (names): Brad Hammers

Sampling Method: ☐Electrofishing ■Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other

Preservation Method: ☐Freezing ☐Other — Notes:

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (mm)	WEIGHT (g)	REMARKS
20-0051-H	2012132	Lake Trout	7/15/20	12	8	M AD	584	2111	
20-0052-H	2012133	Lake Trout	7/15/20	12	4	M AD	456	927	
20-0053-H	2012134	Lake Trout	11	9	5	M AP	560	1832	
20-0054-H	2012135	Lake Trout	11	9	8	M AD	684	2570	
20-0055-H	2012136	Lake Trout	11	8	8	F AD	579	1806	
20-0056-H	2012137	Lake Trout	7.16.20	45	5	M AD	594	2078	
20-0057-H	2012138	Lake Trout	7.16.20	43	5/10	M AD	595	2063	
20-0058-H	2012139	Lake Trout	7.16.20	43	7	F LP	623	2494	
20-0059-H	2012140	Lake Trout	7.29.20	22	5		528	1226	
20-0060-H	2012141	Lake Trout	7.29.20	22	5		588	1885	
20-0061-H	2012142	Lake Trout	7.29.20	23	7		665	2565	
20-0062-H	2012143	Lake Trout	7.29.20	23	7		710	3338	
20-0063-H	2012144	Lake Trout	7.29.20	23	5/9		631	2186	
20-0064-H	2012145	Lake Trout	7.29.20	23	5		552	1673	
20-0065-H	2012146	Lake Trout	7.29.20	21	5		540	1482	

richter: revised 2011

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES
FISH COLLECTION RECORD

Project and Site Name: Seneca Lake Standard Gang Netting — DEC Region: 8

Collections made by (names): Brad Hammers

Sampling Method: ☐Electrofishing ■Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other

Preservation Method: ■Freezing ☐Other — Notes:

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (mm)	WEIGHT (g)	REMARKS
20-0066-H	2012 147	Lake Trout	7.29.20	21	5		581	1895	
20-0067-H	2012148	Lake Trout	7.29.20	20	6		624	2654	
20-0068-H	2012149	Lake Trout	7.29.20	20	5		511	1127	
20-0069-H	2012150	Lake Trout	7.29.20	20	5		516	1222	
20-0070-H	2012151	Lake Trout	7.29.20	20	8?		725	4184	
20-0071-H	2012152	Lake Trout	7/30/20	73	8		678	2939	
20-0072-H	2012153	Lake Trout	7/30/20	72	8		626	2135	

richter: revised 2011

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, Brad Hammond (Print Name), of 6274 East Avon-Lima Rd, Avon (Print Business Address) NY 14414 collected the following on 7/15, 9/15, 9/16 (Date), 2020 from Honeoye Lake (Water Body)

in the vicinity of Lakewood (Landmark, Village, Road, etc.)

Town of Various, in Various County.

Item(s) 10 Yellow Perch

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on 7/15, 9/15, & 9/16, 2020.

BE Hammond
Signature

9/16/20
Date

I, Brad Hammond, received the above mentioned sample(s) on the date specified and assigned identification number(s) 202126, 202154-202162 to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

BE Hammond
Signature

9/16/20
Date

SECOND RECIPIENT (Print Name): Steven Robb	TIME & DATE: 9:00 AM 11/5/20	PURPOSE OF TRANSFER: Transfer to Hale Creek Staff
SIGNATURE: Steven Robb	UNIT: Region 8 Fisheries	
THIRD RECIPIENT (Print Name): Robert Bordsen	TIME & DATE: 11:45 11/5/2020	PURPOSE OF TRANSFER: To Hale Creek
SIGNATURE:	UNIT: Fisheries	
FOURTH RECIPIENT (Print Name):	TIME & DATE:	PURPOSE OF TRANSFER:
SIGNATURE:	UNIT:	
RECEIVED IN LABORATORY BY (Print Name): DAVID BRYK	TIME & DATE: 1500 11/5/2020	REMARKS:
SIGNATURE:	UNIT: HCFS	
LOGGED IN BY (Print Name): Chloe Armato	TIME & DATE: 1:10 pm 11/19/2020	ACCESSION NUMBERS: 20-0331-H → 20-0340-H
SIGNATURE:	UNIT: HCFS	

richter: revised 21 April 2014; becker: 2017 March 2017

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES
FISH COLLECTION RECORD

Project and Site Name: Seneca Lake, forage netting — DEC Region: 8

Collections made by (names): _____

Sampling Method: ☐Electrofishing ☒Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other _____

Preservation Method: ☒Freezing ☐Other _____ Notes: _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (mm)	WEIGHT (g)	REMARKS
20-0331-H	2012154	Yellow Perch	9/15/20	Seneca Lake	5		300	355	
20-0332-H	2012155	↓	↓	↓	4		257	214	
20-0333-H	2012156				4		255	213	
20-0334-H	2012157				4		234	125	
20-0335-H	2012158				6		362	592	
20-0336-H	2012159				7		271	211	
20-0337-H	2012160	↓	↓		7		360	706	
20-0338-H	2012161	Yellow Perch	9/16/20		5		314	437	
20-0339-H	2012162	↓	↓	↓	6		276	305	

richter: revised 2011

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES
FISH COLLECTION RECORD

Project and Site Name Seneca Lake Standard Gang Netting DEC Region 8

Collections made by (names) Brad Hammers

Sampling Method: ☐Electrofishing ■Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other

Preservation Method: ☐Freezing ☐Other Notes:

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (mm)	WEIGHT (g)	REMARKS
20-0340-H	2012126	Yellow Perch	7/15/20	11	7		312	455	

richter: revised 2011