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 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 (PFDA), perfluorohexane sulfonic acid (PFHxS).

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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-1octansulfonamide (N-MeFOSA), n-ethylperfluoro-1-octanesulfonamide (N-EtFOSA), nmethylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA), n-ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA), 2-(n-methylperfluoro-1-octanesulfonamido)-ethanol (N-MeFOSE), 2-(n-ethylperfluoro-1octanesulfonamido)-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 9chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CI-PF3ONS), potassium 11-chloroeicosafluoro-3oxaundecane-1-sulfonic acid (11CI-PF3OUdS), 3-perfluoropropyl propanoic acid (3:3 FTCA), 3perfluoropentyl propanoic acid (5:3 FTCA), 3-perfluoroheptyl propanoic acid (7:3 FTCA), potassium perfluoro(2-ethoxyethane) sulfonate (PFEESA), perfluoro-4-oxapentanoic acid (PFMPA), perfluoro-5oxahexanoic 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).

20-0340-H	20-0339-H	20-0338-H	20-0337-H	20-0336-H	20-0335-H	20-0334-H	20-0333-H	20-0332-H	20-0331-H	20-0072-H	20-0071-H	20-0069-H	20-0067-H	20-0062-H	20-0060-H	20-0054-H	20-0053-H	20-0052-H	20-0050-H	20-0049-H	20-0048-H	20-0046-H	20-0045-H	20-0044-H	20-0042-H	20-0041-H	20-0040-H	20-0039-H	20-0035-H	20-0034-H	20-0031-H	20-0025-H	20-0022-H	LABNO
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455	305	437	706	211	592	125	213	214	355	2135	2939	1222	2654	3338	1885	2570	1832	927	1180	1206	1963	2265	1126	1729	1899	3090	1134	964	425	1446	907	567	1503	WGTG
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Note: See Appendix A for general information and a data dictionary for this table.

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

PFAS LABNO TAGNO SPP **PFPeA PFHxA** PFHpA PFOA **PFDA PFUnA PFDoA** PFBS PFBA PFNA 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 -2.00 -2.00 2012105 LT -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00-1.00 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 LT -2.00 -1.00 5.35 -2.00 2012115 -1.00 -1.00 -1.00 6.76 5.56 1.30 -1.00 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 1.22 9.27 -2.00 LT -2.00-1.00 -1.00 -1.00 -1.00 -1.00 2.38 3.30 -1.00 -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 -2.00 -2.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 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 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 -2.00 2.36 -2.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00-1.00 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 LT -2.00 -1.00 -2.00 2.92 20-0050-H 2012131 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00-1.00 -2.00 20-0052-H -2.00 -2.00 -2.00 2012133 LT -1.00 -1.00 -1.00 -1.00 9.26 6.13 5.16 1.42 -1.00 23.4 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 -2.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -2.00 -2.00 LT -2.0020-0069-H 2012150 I T -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 -1.00 -1.00 -2.00 -2.00 1.06 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 4.36 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 YΡ -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 YΡ 20-0332-H 2012155 -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 YΡ -2.00 -1.00 -1.00 -2.00 3.50 -2.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 YΡ 20-0334-H 2012157 -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 YΡ 2012158 -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 YΡ -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 YΡ -2.00 2012160 -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 YΡ -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 YΡ -1.00 -1.00 20-0339-H 2012162 -2.00 -1.00 -1.00-1.00 -1.00 -1.00 -1.00 -1.00 -2.00 -2.00 -2.00 20-0340-H 2012126 YΡ -2.00 3.99 7.06 2.80 -2.00 34.7 -1.00 -1.00 -1.00 -1.00 7.09 -1.00 -2.00

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

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	LABOR/ CONT SAM	ROL		RENCE RIAL *		ATORY ATES **	MDL
	MEAN %R	RSD (%)	MEAN %R	RSD (%)	# of PAIRS	MEAN RPD %	(ng/g)
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

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Signature FOURTH RECIPIENT (Print Name) SIGNATURE RECEIVED IN LABORATORY BY (Print Name)	Annual for the sample(s) of the and dy until subsequently transferred, pro- ature TIME & DATE II: 30 3/24/20 UNIT Fisher (es) TIME & DATE UNIT IIME & DATE UNIT ne) TIME & DATE UNIT NE & DATE UNIT	PURPOSE OF TRANSFER PURPOSE OF TRANSFER Transfort to Hale Creek PURPOSE OF TRANSFER PURPOSE OF TRANSFER PURPOSE OF TRANSFER
SECOND RECEIPTENT (Print Name) SIGNATURE FOURTH RECEIPTENT (Print Name) SIGNATURE RECEIVED IN LABORATORY BY (Print Name) SIGNATURE RECEIVED IN LABORATORY BY (Print Name)	All atta for the sample(s) of the atta dy until subsequently transferred, pro- ature TIME & DATE UNIT TIME & DATE	PURPOSE OF TRANSFER PURPOSE OF TRANSFER Transfort to Hale Creek PURPOSE OF TRANSFER PURPOSE OF TRANSFER PURPOSE OF TRANSFER
Ample(s): Print Performed in my custor ates as attested to below Signal SECOND RECEIPTENT (Print Name) STRUCH KOLS SIGNATURE FOURTH RECEIPTENT (Print Name) SIGNATURE RECEIVED IN LABORATORY BY (Print Name LYLE, STEVENS	And the state of the sample state of the st	PURPOSE OF TRANSFER PURPOSE OF TRANSFER Transfort to Hale Creek PURPOSE OF TRANSFER PURPOSE OF TRANSFER PURPOSE OF TRANSFER ACCESSION NUMBERS
SIGNATURE RECEIVED IN LABORATORY BY (Print Name) SIGNATURE COGGED IN BY (Print Name)	And the state of the sample state of the st	PURPOSE OF TRANSFER PURPOSE OF TRANSFER Transfort to Hale Creek PURPOSE OF TRANSFER PURPOSE OF TRANSFER PURPOSE OF TRANSFER
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U		NEW YORK DI	STATE DE	NEW YORK STATE DEPARTMENT OF AND MARINE RESOURCES DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES FISH, COLLECTION RECORD	VIRONM VD MARI V RECOR	ENTAL CO NE RESOU UD	NSERVATI RCES	NO	pageof
roject an	Project and Site Name	Severa Lake		Stardard Crown Ned	Netting			-	DEC Region 8
ollection	ame	Bred	Hanners	vers (10110			
ampling	Sampling Method: DElectrofishing	ishing G Gill netting		DTrap netting DTrawling		DSeining. DAngling	gling DOther	her .	
reservati	Preservation Method: EFreezing	zing DOther		2	Notes:				
FOR LAB USE ONLY- LAB	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (mm)	(S)	REMARKS
TO-DO-DO-DO-DO	1012101	Lake Fruit	7/14/20	36	5	FAD	555	1956	
H-E000-VIC		/ ake Front	7/14/20	86	9	F AD	560	1503	
NO2 11		LakeTrant	02/11/120	86	9	AP W	635	3381	
H-00-00	-	Lake Tront	02/H1/L	86	4	WI L	385	C87	
1	-	Lake That	"CHIL	86	H	F IM	420	267	
H-Stop-dr		Late tract	7/14/20	86	11	F AD	660	3118	
	Loicinc	Lake Trent	c2/H/L	86	10	M AD	415	2608	
H-1 TO	20-002 1-H 2012108	1. to Frent	7/14/20	86	I	WI W	0/11	278	
No NOVE II	2012109	1.ke Trait	7/14/20	86	9	M AD	545	1361	
The second	on social 201 2110	Lake that	at/h1/L	91	10	F AD	635	2977	
H DSO	20101	Lake Trent	02/h1/L	16	5	F AD	475	709	
M-1800-00	C1 0 1 0 0	12 to Tent	7/14/20	- 16	Ŧ	WE W	4/60	FOP	
H-1200	20-0031-H XU XI XI Z	1 ske Frank	7/14/20	41	L	M AD	543	1631	
H-0500-07	HIC ION	1 sto Fait	7/11/20	88	9	M AD	550	9 hh I	
AU-DOST-H	201	1 in them	ochile	XX	L	WITW	375	SCH	

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<u>).</u>		NIG	ISION OF F	DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES FISH COLLECTION RECORD	ND MARI	NE RESOUI D	RCES		<
Project a	Project and Site Name	Seveca	Lake S	5	Grand				DEC Region
Collectio	Collections made by (names) Abred Hauwaler S Samuling Method: Electrofishing CGill netting DTrap netting	Chrcd ishing Collin	Hawward		ing DSei	Trawling Deining Dangling	gling Other	her	
Preserval	Preservation Method: #Freezin	ing Other			Notes:				
FOR LAB USE ONLY- LAB	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH (MM)	WENGHT (\hat{S})	REMARKS
20-002C-H	201216	Lake Trant	25/H/L	33	T	M AD	480	1049	
Interve of	-	/ato Trat	cz/h1/L	88	4	WH L	510	-1911	
N-6200-00	-	Late trait	02/H1/L	88	4	MI 1	475	964	
70-0039-H	1	Leke hart	oc/41/L	88	T	MAD	520	h96	
30-004h-4		Lake That	as/14/1	88	T	MIW	500	11.34	
H-HON-VC	-	Late Trut	sc/HI/L	88	4+	M AD	705	3 090	
N-CHUN-NC	1	-	7/14/20	88	9	FAD	595	1899	
N-24-00-0C		-	acht/L	90	=	E AD	610	Ther.	
H-H-H00-0C	-	LakeThart	Thule	06	-	M PD	555	141	
1-20-00-95-H	11.0.00	Lake Trait		11	3	-	512	1166	
H-2H00-0C	2012127	Lake Trait	7/15/20	-	~=	W HU	610		
H-EH00-00	4 2012128	LakeTrait	~/51/2	-	- 4		-	1923	
H-81-00-0°C	20 12129	LakeTrout	2/51/2	1	0	2	010	1 01	
H-PHOD-0C		Leketrant	07/51/L	F	2	W TW		April 1	đ.
4-0000-V	10-0050-11 201 21 31	Lake That	2/11/2	12	7	WIW	1		

J		NEW YORK	STATE DEP.	NEW YORK STATE DEPARTMENT OF LAVIRONMENTAL CONSERVATION DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES FISH COLLECTION RECORD	VIRONMI ND MARE N RECOR	NTAL CONSET VE RESOURCES	NSERVATIO	N	page <u>5</u> of <u>4</u> DEC Region <u>8</u>
Project and Collections	Project and Site Name Collections made by (names)) Bred	Harmers	NEVS					
Sampling 1	Sampling Method: DElectrofishing aGill netting	ofishing MGill n		Trap netting Trawling Note	ling Seining Notes:		□Angling □Other	U	
FICSCIVALIA FOR LAB USE ONLY-LAB	COLLECTION OR TAG NO.	643	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	(mm)	(G)	REMARKS
ENTRY NO.	ALANCI, U. 201913.2	1. ko Trent	7/15/20	12	8	A AD	584	2111	
H L L CON	20 000 11 2012 122	/akeThat	7/15/20	12	I	A HD	456	927	
H-PCA	HEILING IL CARON	Lake Tour	11	6	5	M-AP	560	1832	
H-CAN	1.1-100	1 abo - Wint	11	0	8	M PD	664	2570	
H-H(0)	25 1 CIAC H-H200-04	hard other	0	8	80	F AD	579	1306	
H-YXX	70-0051-H 2012137	Lake Travt	716.20	45	5	MAD	594	2078	
H-LSN	Dr. nu57-H2012138	Lake Tout	7 16.20	43	5/10	r	595	2063	
20-0058-1 2012-1	2012 1.39	lake tract	7.16.20	43	~	F LP	623	5467	
1-550	20-0059-011 012 1 40	Lake Trout	7.29.20	22	N		528	1226	
H-O'N	1412102 H-07/10-00	LokeTout	7,29,20	22	S		286	5831	
10-00/1-H	2612142	LakeToot	7.29.20	23	r		(obs)	2565	
1.000	241 0100	Lake Treat	7.29.20	23	L		210	3338	
10-00-07 AL	2010-1	Lake Tout	02.92.7	25	5/9		631	218%	
11 11 1 1 1 1 V	-	cottoot	7.29.20	23	N		552	1673	
H-H-00-07	1	Lake Treat	7.29.20	12	ч		005	22/1	

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Servece Lake Strude of lange Dec Region es) Dred Howmers Dec Region constring Other Itaming Dred constring Other Notes: Notes: cering Dother Notes: Notes: rescring Dother Notes: Notes: $nexting rown Notes: Notes: nexting rown Notes: Notes: nexting rown 7:29:20 2:0 5:1 1.4k_{1.7out} 7:29:20 2:0 5:1 1:27:2 1.4k_{1.7out} 7:29:20 2:0 5:10 1:27:2 1.0k_{1.7out} 7:29:20 2:0 $	Servece Lake Standard Cency Mathing Dec Regi new) Brrad Harmer S Decres Decres Decres aronshing Gill neting D'Trayneting D'Trayning Decining D'trayneting Decres aronshing Gill neting D'Trayneting D'Trayneting D'trayneting D'trayneting D'trayneting D'trayneting aronshing exit Notes: Notes: Notes: Notes: Notes: recring DOther Notes: Notes: Notes: Notes: Notes: 1 Lok, Toor 1<29.20 2.1 5 D'24 d.54 Lok, Toor 7:29.20 2.0 5 510 12.7 Lak, Toor 7:29.20 2.0 5 510 12.7 Lak, Toor 7:29.20 2.0 5 510 12.7 Lak, Toor 7:29.20 2.0 5 510 12.7 Lake Troor 7:29.20 2.0 5 510 12.7 Lake Troor 7:29.20 2.0 5 510 12.7 Lake Troor 7:29.20 2.0 5 511 12.7 Lake Troor	Ś		NEW YORK DIV	STATE DEP/ ISION OF FI	NEW YORK STATE DEPART MENT OF LAVIRONMENTAL CONSERVATION DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES FISH COLLECTION RECORD	RONME	NTAL CON	SERVATH	N	page 1 of 1
Interced Hormens anoffshing Gill meting DTray meting DTray meting DTray meting anoffshing Gill meting DTray meting DTray meting DTray meting recring DOlter Notes: Notes: recring Dolter Notes: Notes: recring Dolter Notes: Strent Weight R Strents TAREN Location Add Strent Weight 11 Lok, Teach 7:29:20 2.0 5 51/1 1:27 Lake, Teach 7:29:20 2.0 5 51/6 1:27:2 Lake, Teach 7:29:20 2.0 5 51/6 1:27:2 Lake, Teach 7:29:20 2.0 5 51/6 1:27:2 Lake, Teach 7/30/ko 7:2 8 6/2 & 2/3 2/35 Lake, Teach 7/30/ko 7:2 8 6/2 & 2/3 2/35 Lake, Teach 7/30/ko 7/2 8 6/2 & 2/3 2/135 Lake, Teach 7/30/ko 7/2 8 6/2 & 2/3 2/135 Lake, Teach 7/30/ko 7/2 8 6/2 & 2/3 2/135 Lake, Teach	Intervention Interventintervention Intervention	Project and	Site Name	Jenece	Lake		Gen	5 Ne	ting		DEC Region 8
trofishing Gill netting DTrap netting DTravling Calining I Childer Interesting I Childer I construct the spectral potter interesting I Childer I construct interesting I Childer I construct interesting I construct I constr	Transing Gitt netting Transming Changing Date International Control of the termine Changing Date International Control of the termine the termine the termine termine termine the termine ter	Collections	made by (names		Hann	ners					
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R SPECHES DMTE TAKEN LOCATION AGE SEX BOR REPORT WEIHT (9) WEIHT (9) 17 LOK, Tayle 7:29:20 2.1 5 581 1895 10 LOK, Tayle 7:29:20 2.0 6 624 a.654 Lok, Tout 7:29:20 2.0 5 511 1127 Lok, Tout 7:29:20 2.0 5 511 1127 Lok, Tout 7:29:20 2.0 5 511 1127 Lok, Tout 7:29:20 2.0 5 511 127 Lok, Tout 7:29:20 2.0 5 510 12.2 Lok, Tout 7:29:20 2.0 5 510 2.335 Lok, Tout 7:20:20 2	R SPECIES DATE TAKEN LOCATION AGE SEXADDS LENGTH WEIGHT 17 LOK-Toyot 7.29/20 2.1 5 0244 2.65-3 1 LOK-Toyot 7.29/20 2.0 6 511 11.21 LoK-Toyot 7.29/20 2.0 5 511 11.21 LaK-Toold 7.29/20 2.0 5 511 11.21 Lake Toold 7.29/20 2.0 5 511 11.21 Lake Toold 7.29/20 7.3 8 6/3/6 21/3 Lake Toold 7.79/30/20 7.3 8 6/3/6 21/3 Lake Toold 7.79/30 7.3 8 6/3/6 21/3 Lake Toold 7/30/20 <	Preservation	n Method: PFree	zing DOther		Not	cs:				
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Lake Trant 7:29:20 20 5 510 125 Lake Trant 7:29:20 20 5 510 125 Lake Trant 7:29:20 20 8? 725 Lake Trant 7:29:20 20 8? 725 Ledee Trant 7:30/20 72 8 6.26 Ledee Trant 7:30/20 72 8 6.26	Lake Teart 7:29:20 20 5 5!1 Lake Teart 7:29:20 20 5 5!1 Lake Teart 7:29:20 20 5 5!10 1 Lake Teart 7:29:20 20 8? 725 725 Lake Teart 7/30/80 73 8 6.78 6.78 Ledie Treat 7/30/80 72 8 6.26 6.26 Ledie Treat 7/30/80 72 8 6.26 6.26 Lake Treat 7/30/80 72 8 6.26 6.26	H-9900-0	Tala uta	Let Tat	7.29.20	20	e		624	2654	
Lave Travet 7:29:20 20 5 510 Lave truth 7:79:80 70 8? 725 Lave truth 7:79:80 7.3 8 6.78 Loke Tirout 7/30/80 7.3 8 6.78 Lake Torout 7/30/80 7.2 8 6.36 Lake Torout 7/30/80 7.2 8 6.36	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	H-L-100-0	2417 107	Lake Traut	7.29,20	20	S		119	1127	
Lave tick 7:29:20 30 8? 725 Lete Tread 7/30/20 73 8 678 Lete Tread 7/30/20 72 8 626	Lave tick 7:29:20 3:0 8? 725 Lelee Tirout 7/30/20 3:3 8 6.78 Lelee Tirout 7/30/20 3:2 8 6.36		6111100	int Tout	7.79.20	20	ъ		SILO	2221	
Lette Trout 7/30/20 73 8 678 Lette Trout 7/30/20 72 8 626	Leke Trout 7/30/20 7.3 8 6.78 Leke Trout 7/30/20 7.2 8 6.26 Leke Trout 7/30/20 7.2 8 6.26	-	1212120	Inve trick	1.79.20	OC	28		725	4184	
Lake Troot 7/30/22 8 626	Lake Troot 7/30/20 72 8 626	1-0100-0	1010150	I also Tend	2/20/2	Lt.	00		678	2939	
		H-1+00-0	TURIDY	LEVE IV ON	7 192 6	22	8		626	2135	
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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION CHAIN OF CUSTODY

(Print Business Address) NV 14464 YEAU 0200 Hannes (Print Name) AIC (Water Body) following on 7/15, 9/15, 9/16 SONSCA L 2020 from AKWOS in the vicinity of (Landmark, Village, Road, etc.) VALING County. VARIN în Town of 10 VELLOW PSACH Item(s) 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 123 Date Signature , received the above mentioned sample(s) on the date specified 1. BRAD Hammen and assigned identification number(s) 2012126, 2012154-2012162 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 PURPOSE OF TRANSFER TIME & DATE SECOND RECIPIENT (Print Name) 9:00 AM Transfer to Hale Creek Steven Robb 15/20 UNIT SIGNATURE Staff Region 8 Fisheri PURPOSE OF TRANSFER TIME & DATE To HALE Creek 11:45 2020 a UNIT PURPOSE OF TRANSFER TIME & DATE OURTH RECIPIENT (I UNIT SIGNATURE REMARKS TIME & DATE RECEIVED IN LABORATORY BY (Print Name) 11 5 2020 1500 BRYK DAVID UNIT SIGNATURE, HCFS ACCESSION NUMBERS TIME & DATE LOGGED IN BY 3 20-0331-H 1:10pm 11/19/2020 UNIT SIGN 20-0340-4 HCFS revised 21 April 2014; becker: 2017 March 2017

)		NEW YORH	VISION OF	NEW YORK STATE DEPARTMENT OF AND MARINE RESOURCES DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES	D MARI	NE RESOU	RCES	5	hafter the com
Project and	Project and Site Name	enera late brage netti	Chorage	nething					DEC Region
Collection Sampling	Collections made by (names)	fishing AGill r		Trap netting Trawling		Seining DAn	□Angling □Other	ler	
Preservati	Preservation Method: XFreezing	zing Other_		No	Notes:				
FOR LAB USE ONLY-LAB ENTRY NO	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	(MIN)	(g)	REMARKS
H-1225	NO-0331-H DOIDISM	Kelby Red	ginc/20	Senoca hale	5		300	355	
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1-5220	321 C loc 1. 5220-00		3	_	و		362	265	
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Preservation Method: Diffecting Dother Ante Exercise Other Reamage Reamage <th>DOther Dotter sectes DATE TAKEN LOCATION AGE SEX &OR REPROD. LENOTH Sectes 71/s/20 11 7 312, Olou/ Berek 71/s/20 11 7 312,</th> <th>Collections made by (names) ひょん Hawwers</th> <th>Severa L) Brad</th> <th>FISH COL ALE Stands HCMMCS etting OTrap netting</th> <th>A G</th> <th>g DSein</th> <th>Netting</th> <th>gling D0ther</th> <th>her</th> <th>DEC Region</th>	DOther Dotter sectes DATE TAKEN LOCATION AGE SEX &OR REPROD. LENOTH Sectes 71/s/20 11 7 312, Olou/ Berek 71/s/20 11 7 312,	Collections made by (names) ひょん Hawwers	Severa L) Brad	FISH COL ALE Stands HCMMCS etting OTrap netting	A G	g DSein	Netting	gling D0ther	her	DEC Region
Yellow Beck, 7/15/200 11 7 312 11 312 11 312 11 312 11 312 12 31	Yellow Res, 7/15/20 11 7 312 11 312 11 312 312 312 312 312 312 312 312	on Method: DFree COLLECTION OR		DATE	1	AGE	SEX &/OR REPROD.	(WW)	WEIGHT (3)	REMARKS
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