NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife
Hale Creek Field Station
182 Steele Ave Extension
Gloversville, NY 12078-5710
P: (518) 773-7318
www.dec.ny.gov

PFAS Analyses of Fish Collected in 2019 from Kendaia Creek in the vicinity of the Seneca Army Depot

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*Analytical Services staff**
David Bryk, Shabbir Alam, Chloe Armato, Brian Buanno, John Finn, Kyle Gould, Tanya Jasewicz, and Katryn Williams

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ABSTRACT

The Analytical Services Unit (ASU) at Hale Creek Field Station (HCFS) conducted chemical analyses on a total of 20 fish samples collected from Kendaia Creek. 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 22-28. This report consists of the analytical data associated with 20 samples that were analyzed for PFAS. Maximum contaminant levels found in the samples were 5.19 ng/g for perfluorohexanoic acid (PFHxA), 2.03 ng/g for perfluoroheptanoic acid (PFHpA), 2.82 ng/g for perfluorooctanoic acid (PFOA), 3.56 ng/g for perfluorononanoic acid (PFNA), 3.33 ng/g for perfluorodecanoic acid (PFDA), 2.46 ng/g for perfluoroundecanoic acid (PFUnA), 1.63 ng/g for perfluorododecanoic acid (PFDoA), 4.05 ng/g for perfluorohexane sulfonate (PFHxS), 374 ng/g for perfluorooctanesulfonic acid (PFOS), and 2.15 ng/g for perfluorooctane sulfonamide (PFOSA). Levels were below detection limits for perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), and perfluorobutanesulfonic acid (PFBS).

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* For more information, please contact David Bryk at David.Bryk@dec.ny.gov or phone (518) 773-7318.

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SAMPLE INFORMATION

This report consists of results of analyses of 20 fish samples collected in 2019 from Kendaia Creek in the vicinity of the Seneca Army Depot for the Toxic Substance Monitoring Program. The fish collected were 10 Creek Chub (CCHUB) and 10 Blacknose Dace (BDACE). The fish were collected by Benjamin Carson, Steven Robb, and Bree Minges of NYSDEC Region 8. Collection records for the samples are attached at the end of this report.

LABORATORY METHODS

The ASU analyzed 20 samples for selected PFAS. The ASU Lab Numbers assigned to the samples were 19-1025-H through 19-1044-H. The ASU program name assigned to the samples was KendaiaCr-19.

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), perfluoropentanesulfonic 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-octanesulfonamide (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, PFPeA, and PFBS.

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

- NFDHA was detected above 10 ng/g in five samples (19-1035-H, 19-1036-H, 19-1042-H, 19-1043-H, and 19-1044-H).

All sample information and results are also contained in file “REP 23-25 (KendaiaCr-19).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 Kendaia Creek in 2019

LABNO	TAGNO	SPP	SDATE	LOCATION	PREP	LENMM	WGTG	PROGRAM	NO ANLY
19-1025-H	0996184	CCHUB	20190703	Kendaia Creek	W	145	35	KendaiaCr-19	1
19-1026-H	0996182	CCHUB	20190703	Kendaia Creek	W	98	15	KendaiaCr-19	2
19-1027-H	0996185	CCHUB	20190703	Kendaia Creek	W	92	11	KendaiaCr-19	3
19-1028-H	0996188	CCHUB	20190703	Kendaia Creek	W	111	15	KendaiaCr-19	2
19-1029-H	0996187	CCHUB	20190703	Kendaia Creek	W	113	15	KendaiaCr-19	2
19-1030-H	0996181	CCHUB	20190703	Kendaia Creek	W	103	15	KendaiaCr-19	2
19-1031-H	0996191	CCHUB	20190703	Kendaia Creek	W	100	11	KendaiaCr-19	3
19-1032-H	0996178	CCHUB	20190703	Kendaia Creek	W	96	10	KendaiaCr-19	3
19-1033-H	0996177	CCHUB	20190703	Kendaia Creek	W	75	5.3	KendaiaCr-19	6
19-1034-H	0996189	CCHUB	20190703	Kendaia Creek	W	77	5.3	KendaiaCr-19	6
19-1035-H	0996179	BDACE	20190703	Kendaia Creek	W	59	2.3	KendaiaCr-19	13
19-1036-H	0996192	BDACE	20190703	Kendaia Creek	W	55	1.9	KendaiaCr-19	15
19-1037-H	0996180	BDACE	20190703	Kendaia Creek	W	61	3.1	KendaiaCr-19	10
19-1038-H	0996176	BDACE	20190703	Kendaia Creek	W	65	3.2	KendaiaCr-19	9
19-1039-H	0996194	BDACE	20190703	Kendaia Creek	W	64	2.7	KendaiaCr-19	11
19-1040-H	0996190	BDACE	20190703	Kendaia Creek	W	58	2.5	KendaiaCr-19	13
19-1041-H	0996175	BDACE	20190703	Kendaia Creek	W	61	2.8	KendaiaCr-19	11
19-1042-H	0996193	BDACE	20190703	Kendaia Creek	W	55	1.8	KendaiaCr-19	17
19-1043-H	0996186	BDACE	20190703	Kendaia Creek	W	57	2.1	KendaiaCr-19	17
19-1044-H	0996183	BDACE	20190703	Kendaia Creek	W	56	1.9	KendaiaCr-19	17

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

Table 2: Concentration of PFAS in ng/g in Fish Collected from Kendaia Creek in 2019

LABNO	TAGNO	SPP	PFAS												
			PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnA	PFDoA	PFBS	PFHxS	PFOS	PFOSA
19-1025-H	0996184	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.47	1.70	-1.00	-1.00	-2.00	139	-2.00
19-1026-H	0996182	CCHUB	-2.00	-1.00	1.68	-1.00	-1.00	-2.00	2.00	2.40	1.38	-1.00	-2.00	103	-2.00
19-1027-H	0996185	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.96	2.24	1.17	-1.00	-2.00	118	-2.00
19-1028-H	0996188	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.57	2.06	1.26	-1.00	-2.00	123	-2.00
19-1029-H	0996187	CCHUB	-2.00	-1.00	-1.00	-1.00	1.43	-2.00	1.98	1.96	-1.00	-1.00	2.16	86.5	-2.00
19-1030-H	0996181	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.53	2.19	1.63	-1.00	-2.00	81.6	2.15
19-1031-H	0996191	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.95	2.15	1.28	-1.00	-2.00	98.6	-2.00
19-1032-H	0996178	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.47	1.62	-1.00	-1.00	-2.00	111	-2.00
19-1033-H	0996177	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.84	2.39	1.37	-1.00	-2.00	85.3	-2.00
19-1034-H	0996189	CCHUB	-2.00	-1.00	-1.00	-1.00	-1.00	-2.00	1.98	2.46	1.26	-1.00	-2.00	106	-2.00
19-1035-H	0996179	BDACE	-2.00	-1.00	2.34	1.95	-1.00	2.46	2.62	2.15	-1.00	-1.00	2.54	278	-2.00
19-1036-H	0996192	BDACE	-2.00	-1.00	4.74	1.81	-1.00	-2.00	2.71	2.40	-1.00	-1.00	-2.00	203	-2.00
19-1037-H	0996180	BDACE	-2.00	-1.00	3.73	1.22	-1.00	2.15	2.18	1.61	-1.00	-1.00	4.05	239	-2.00
19-1038-H	0996176	BDACE	-2.00	-1.00	3.31	1.10	1.06	-2.00	1.69	1.43	-1.00	-1.00	2.18	223	-2.00
19-1039-H	0996194	BDACE	-2.00	-1.00	2.95	1.37	2.82	3.49	3.04	2.22	-1.00	-1.00	3.71	311	-2.00
19-1040-H	0996190	BDACE	-2.00	-1.00	3.38	1.87	1.74	2.91	2.34	1.88	-1.00	-1.00	2.88	272	-2.00
19-1041-H	0996175	BDACE	-2.00	-1.00	5.19	1.19	1.04	2.96	2.79	1.89	-1.00	-1.00	3.17	309	-2.00
19-1042-H	0996193	BDACE	-2.00	-1.00	2.71	2.01	1.43	2.99	3.33	2.26	-1.00	-1.00	2.70	374	2.07
19-1043-H	0996186	BDACE	-2.00	-1.00	2.63	2.03	-1.00	2.89	2.84	1.95	-1.00	-1.00	2.76	289	-2.00
19-1044-H	0996183	BDACE	-2.00	-1.00	1.79	1.58	1.97	3.56	3.03	2.16	-1.00	-1.00	3.20	329	-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 23-25 (KendaiaCr-19).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 23-25 (KendaiaCr-19).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; CCHUB=Creek Chub and BDACE=Blacknose Dace (character)
4. SDATE - date sample was collected; format is YYYYMMDD (character)
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 three method blanks, three reference material samples, three laboratory control samples, and three duplicate samples. The reference materials were two IRMM 427 and one 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 RSD of any of the following measures was greater than 30 percent (see Table B1):

- RSD of replicate analyses of laboratory control samples or
- RSD of replicate analyses of the reference material or
- mean RPD of laboratory duplicates.

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 23-25, except for the following:

- Eleven samples for isotopic dilution standard recoveries for M8FOSA-I, as listed below. The acceptable range is 40-150% recovery.

Sample ID	% recovery	Sample ID	% recovery	Sample ID	% recovery	Sample ID	% recovery
19-1029-H	161%	19-1032-H	163%	19-1038-H	155%	19-1041-H	160%
19-1030-H	151%	19-1035-H	151%	19-1039-H	180%	19-1043-H	161%
19-1031-H	165%	19-1036-H	155%	19-1040-H	153%		

Table B1: Percent Recovery, Precision, and MDLs of Per- and Polyfluoroalkyl Substances in Three Laboratory Control Spikes, Three Reference Material Samples, and Three Pairs of Laboratory Duplicates Analyzed at Hale Creek Field Station for Kendaia Creek 2019.

ANALYTE	LABORATORY CONTROL SAMPLE		REFERENCE MATERIAL *		LABORATORY DUPLICATES **		MDL (ng/g)
	MEAN %R	RSD (%)	MEAN %R	RSD (%)	# of PAIRS	MEAN RPD %	
PFBA	102%	1.49	-	-	-	-	2
PFPeA	102%	1.13	-	-	-	-	1
PFHxA	105%	1.46	-	-	-	-	1
PFHpA	104%	1.11	-	-	-	-	1
PFOA	106%	0.546	-	-	1	3.55	1
PFNA	102%	1.13	-	-	-	-	1
PFDA	104%	3.27	-	-	2	3.18	1
PFUnA	103%	0.562	-	-	2	2.49	1
PFDoA	101%	3.66	-	-	1	11.1	1
PFBS	106%	4.73	-	-	-	-	1
PFHxS	94.5%	11.5	-	-	1	8.61	2
PFOS	102%	2.37	118%	7.90	3	3.44	2
PFOSA	97.8%	8.18	-	-	-	-	2

*Reference material for PFOS was IRMM 427 (N=2) and SRM 1947 (N=1).
**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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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I. Ben Carlson (Print Name), of 6274 East Avon Lima Rd (Print Business Address) collected the following on July 3 (Date), 2019 from Keeler Creek (Water Body) in the vicinity of [illegible] Ave Dr & Seneca St Park (Landmark, Village, Road, etc.) Town of Perinton, in Monroe County.

Item(s) Creek Chub 30; Blacknose Dace (133)

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 July 3, 2019.

Ben Carlson — Signature
7/3/19 — Date

I, Brad Hammond, received the above mentioned sample(s) on the date specified and assigned identification number(s) 996175-996194 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.

B Hammond — Signature
7/7/19 — Date

SECOND RECIPIENT (Print Name): Steve Robb	TIME & DATE: 11:50 1/16/20	PURPOSE OF TRANSFER: TSMP
SIGNATURE: Steve Robb	UNIT: DEC Region 8	
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: 12:15 01/16/2020	REMARKS
SIGNATURE	UNIT: HCFS	
LOGGED IN BY (Print Name): Chloé Armato	TIME & DATE: 2:10pm 1-30-2020	ACCESSION NUMBERS: 19-1025-H → 19-1044-H
SIGNATURE	UNIT: HCFS	

richter: revised 21 April 2014; becker: 23 March 2017

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

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Project and Site Name Seneca Army Depot PFAS Kendaia Crk DEC Region 8

Collections made by (names) Carey, Kobb, Mingos

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

Preservation Method: ☑Freezing ☐Other Notes (SWFDB survey number): 819014

	FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	19-1025-H	996184	Cause Cas	7/	Kendaia Crk			145	35	1 TAG #'s NOT
n=2	19-1026-H	996182						118	23	2 IND
		996182						78	7	2 SAME IND
n=3	19-1027-H	996185						115	19	3 CROSS
		996185						92	9	3
		996185						70	4	3
n=2	19-1028-H	996188						137	24	4
		996188						84	6	4
n=2	19-1029-H	996187						137	22	5
		996187						88	8	5
n=2	19-1030-H	996189						134	27	6
		996189						72	3	6
n=3	19-1031-H	996191						106	13	7
		996191						105	13	7
		996191	CATOSTOMUS		Kendaia Crk			84	6	7

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION page 2 of 11
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Mingos

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

	FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
n=3	19-1032-H	0996178	creek chub	7/3	Kendaia Cr			110	14	8
		↓	↓	↓	↓			86	7	8
		0996178						92	9	8
n=6	19-1033-H	0996177						80	6	9
		↓						81	7	9
								68	5	9
								72	4	9
		↓						70	4	9
		0996177						78	6	9
n=6	19-1034-H	0996189						87	7	10
		↓						84	7	10
								80	5	10
								70	5	10
		↓	↓	↓	↓			72	4	10
		0996189	creek chub	7/3	Kendaia Cr			69	4	10

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Minges

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

	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
n=13	19-1035-H	0996179	Blacknose Dace	7/3	Kendaia Cr			60	3	11
								63	3	
								64	3	
								54	2	
								56	2	
								50	1	
								60	3	
								58	2	
								65	3	
								64	3	
								57	2	
								64	2	
		0996179						56	2	11
n=14	19-1036-H	0996192						60	2	12
		0996192	Blacknose Dace	7/3	Kendaia Cr			57	2	12

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Minges

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	0996192	Blacknose Dace	7/3	Kendaia Cr			59	2	12
							66	2	
							61	3	
							62	2	
							50	2	
							50	2	
							49	2	
							45	1	
							50	1	
							55	2	
							40	1	
							65	2	
	0996192						62	3	12
n=10 19-1037-H	0996180						80	9	13
	0996180	Blacknose Dace	7/3	Kendaia Cr			58	2	13

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Mingos

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	0996180	Blacknose Dace	7/3	Kendaia Cr			67	3	13
							61	3	
							50	2	
							69	3	
							64	3	
							59	2	
							56	2	
	0996180						57	2	13
n = 9	19-1038-H 0996176						60	4	14
							70	4	
							65	3	
							59	2	
							60	3	
							69	3	
	0996176	Blacknose Dace	7/3	Kendaia Cr			63	3	14

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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FISH COLLECTION RECORD

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Minges

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

	FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
		0996176	Blacknose Dace	7/3	Kendaia Cr			79	5	14
		0996176						65	2	14
n=11	19-1039-H	0996194						82	5	15
								64	2	↑
								68	2	
								60	3	
								57	2	
								65	2	
								60	3	
								52	2	
								76	4	
		↓						61	3	↓
		0996194						59	2	15
n=13	19-1040-H	0996190	↓	↓	↓			61	2	16
		0996190	Blacknose Dace	7/3	Kendaia Cr			54	3	16

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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FISH COLLECTION RECORD

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Minges

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	0996190	Blacknose Dace	7/3	Kendaia Cr			60	3	16
							64	3	
							59	2	
							62	3	
							58	2	
							53	2	
							55	2	
							60	2	
							63	3	
							55	2	
	0996190						50	3	16
n=11	19-1041-H 0996175						62	3	17
							58	3	
							64	3	
	0996175	Blacknose Dace	7/3	Kendaia Cr			68	3	17

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Mingos

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	0996175	Blacknose Dace	7/3	Kendaia Cr			65	2	17
							60	3	
							59	3	
							58	3	
							60	3	
							59	3	
	0996175						57	2	17
n=17	19-1042-H 0996193						49	1	18
							65	3	
							46	1	
							49	1	
							43	1	
							44	1	
							45	1	
	0996193	Blacknose Dace	7/3	Kendaia Cr			60	2	18

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Minges

Sampling Method: [X] Electrofishing [ ] Gill netting [ ] Trap netting [ ] Trawling [ ] Seining [ ] Angling [ ] Other _____

Preservation Method: [X] Freezing [ ] Other _____ Notes (SWFDB survey number): 819014

FOR LAB USE ONLY - LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	0996193	Blacknose Dace	7/3	Kendaia Cr			64	3	18
	↓	↓	↓	↓			59	1	↑
							66	3	
							59	2	
							50	2	
							58	2	
							60	2	
	↓						60	2	↓
	0996193						62	2	18
n=17	19-1043-H 0996186						55	2	19
	↓						60	2	↑
							56	2	
							52	2	
	↓	↓	↓	↓			63	3	↓
	0996186	Blacknose Dace	7/3	Kendaia Cr			52	1	19

richter: revised 2011, 5/7/15. 10/4/16. 3/20/17; becker: 3/23/17

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Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Minges

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	0996186	Blacknose Dace	7/3	Kendaia Cr			43	1	19
							64	3	
							57	2	
							55	3	
							58	2	
							50	2	
							57	2	
							62	2	
							57	2	
	↓						60	2	↓
	0996186						63	3	19
n=17	19-1044-H 0996183						57	2	20
	↓	↓	↓	↓			47	2	↓
							60	2	
	0996183	Blacknose Dace	7/3	Kendaia Cr			58	2	20

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

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

Project and Site Name Seneca Army Depot PFAS - Kendaia Creek DEC Region 8

Collections made by (names) Carson, Robb, Minges

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

Preservation Method: ☒Freezing ☐Other _____ Notes (SWFDB survey number): 819014

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS
	0996183	Blacknose Dace	7/3	Kendaia Cr			61	3	20
							59	2	
							59	2	
							62	2	
							60	2	
							52	2	
							46	1	
							56	2	
							45	1	
							47	1	
							53	2	
							71	3	
	0996183	Blacknose Dace	7/3	Kendaia Cr			53	2	20

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17

19-1026-H	LENGTH	WEIGHT
n=2	118	23
	78	7
Total Mass		30
AVG	98	15
STDEV	28.28427	11.31371
MAX	118	23
MIN	78	7

19-1027-H	LENGTH	WEIGHT
n=3	115	19
	92	9
	70	4
Total Mass		32
AVG	92.33333	10.66667
STDEV	22.50185	7.637626
MAX	115	19
MIN	70	4

19-1028-H	LENGTH	WEIGHT
n=2	137	24
	84	6
Total Mass		30
AVG	110.5	15
STDEV	37.47666	12.72792
MAX	137	24
MIN	84	6

19-1029-H	LENGTH	WEIGHT
n=2	137	22
	88	8
Total Mass		30
AVG	112.5	15
STDEV	34.64823	9.899495
MAX	137	22
MIN	88	8

19-1030-H	LENGTH	WEIGHT
n=2	134	27
	72	3
Total Mass		30
AVG	103	15
STDEV	43.84062	16.97056
MAX	134	27
MIN	72	3

19-1031-H	LENGTH	WEIGHT
n=3	106	13
	105	13
	88	6
Total Mass		32
AVG	99.66667	10.66667
STDEV	10.11599	4.041452
MAX	106	13
MIN	88	6

19-1032-H	LENGTH	WEIGHT
n=3	110	14
	86	7
	92	9
Total Mass		30
AVG	96	10
STDEV	12.49	3.605551
MAX	110	14
MIN	86	7

19-1033-H	LENGTH	WEIGHT
n=6	80	6
	81	7
	68	5
	72	4
	70	4
	78	6
Total Mass		32
AVG	74.83333	5.333333
STDEV	5.528713	1.21106
MAX	81	7
MIN	68	4

19-1034-H	LENGTH	WEIGHT
n=6	87	7
	84	7
	80	5
	70	5
	72	4
	69	4
Total Mass		32
AVG	77	5.333333
STDEV	7.694154	1.36626
MAX	87	7
MIN	69	4

19-1035-H	LENGTH	WEIGHT
n=13	60	3
	63	3
	64	2
	54	2
	56	2
	50	1
	60	3
	58	2
	65	3
	64	3
	57	2
	64	2
	56	2
Total Mass		30
AVG	59.30769	2.307692
STDEV	4.625736	0.630425
MAX	65	3
MIN	50	1

19-1036-H	LENGTH	WEIGHT
~~A=14~~ (B)	60	2
A=15	57	2
	59	2
	66	2
	61	3
	62	2
	50	2
	50	2
	49	2
	45	1
	50	1
	55	2
	40	1
	65	2
	62	3
Total Mass		29
AVG	55.4	1.933333
STDEV	7.716402	0.593617
MAX	66	3
MIN	40	1

19-1037-H	LENGTH	WEIGHT
n=10	80	9
	58	2
	67	3
	61	3
	50	2
	60	3
	64	3
	59	2
	56	2
	57	2
Total Mass		31
AVG	61.2	3.1
STDEV	8.038795	2.13177
MAX	80	9
MIN	50	2

19-1038-H	LENGTH	WEIGHT
n=9	60	4
	70	4
	65	3
	59	2
	60	3
	60	3
	63	3
	79	5
	65	2
Total Mass		29
AVG	64.55556	3.222222
STDEV	6.463573	0.971825
MAX	79	5
MIN	59	2

19-1039-H	LENGTH	WEIGHT
n=11	82	5
	64	2
	68	2
	60	3
	57	2
	65	2
	60	3
	52	2
	76	4
	61	3
	59	2
Total Mass		30
AVG	64	2.727273
STDEV	8.625543	1.00905
MAX	82	5
MIN	52	2

19-1040-H	LENGTH	WEIGHT
n=13	61	2
	54	3
	60	3
	64	3
	59	2
	62	3
	58	2
	53	2
	55	2
	60	2
	63	3
	55	2
	50	3
Total Mass		32
AVG	58	2.461538
STDEV	4.262237	0.518875
MAX	64	3
MIN	50	2

19-1041-H	LENGTH	WEIGHT
n=11	62	3
	58	3
	64	3
	68	3
	65	2
	60	3
	59	3
	58	3
	60	3
	59	3
	57	2
Total Mass		31
AVG	60.90909	2.818182
STDEV	3.44832	0.40452
MAX	68	3
MIN	57	2

19-1042-H	LENGTH	WEIGHT
n=17	49	1
	65	3
	46	1
	49	1
	43	1
	44	1
	45	1
	60	2
	64	3
	59	1
	66	3
	59	2
	50	2
	58	2
	60	2
	60	2
	62	2
Total Mass		30
AVG	55.23529	1.764706
STDEV	7.941422	0.752447
MAX	66	3
MIN	43	1

19-1043-H	LENGTH	WEIGHT
n=17	55	2
	60	2
	56	2
	52	2
	63	3
	52	1
	43	1
	64	3
	57	2
	55	3
	58	2
	50	2
	57	2
	62	2
	57	2
	60	2
	63	3
Total Mass		36
AVG	56.70588	2.117647
STDEV	5.405607	0.600245
MAX	64	3
MIN	43	1

19-1044-H	LENGTH	WEIGHT
n=17	57	2
	47	2
	60	2
	58	2
	61	3
	59	2
	59	2
	62	2
	60	2
	52	2
	46	1
	56	2
	45	1
	47	1
	53	2
	71	3
	53	2
Total Mass		33
AVG	55.64706	1.941176
STDEV	6.873329	0.555719
MAX	71	3
MIN	45	1