

Appendix 2

Fish Survey

Fish sampling methods

A survey of the Pomperaug River fish community was conducted in August 2004. Surveys were conducted using 6 m², pre-positioned electrofishing grids. This method had been proven by Bain (1985) as an effective method of sampling fish for habitat related studies, and has been successfully applied by the Northeast Instream Habitat Program to investigate fish community and habitat relationships on the Quinebaug, and Eightmile Rivers in Connecticut and on other rivers throughout New England.

Electrofishing grids were sampled within various hydromorphologic units (HMU), or habitat types, throughout 9 previously selected representative sites. We sampled 182 grids, pre-positioned in the stream in sets of seven. Grids were placed within HMU types that were representative of the habitats within that site. We sampled a variety of habitat types, documented and mapped the habitat attributes present within each grid, and collected current velocity data within both the grid and the HMU to determine the distribution of the existing fish fauna with regard to instream habitat.

A team of three to four people conducted sampling. A person trained in fish identification with sufficient electrofishing experience operated the transformer unit (Smith Root 1.5 KVA Electrofisher powered by a Honda EX1000 generator) and measured and identified captured specimens from the stream bank while two to three other people used nets to collect the fish within the stream. Grids were sampled from downstream to upstream as to minimize the disturbance of sediments that may attract or frighten fishes to or from our sampling area in an effort to prevent increases or decreases in the likelihood of sampling certain fish species.

Invertebrate survey

A brief freshwater mussel survey was conducted in 2004 on the Pomperaug River. The survey was conducted using 1x1 meter quadrates placed at seven random locations within specific HMU types. The placement was determined by visually dividing the HMU into square units and using previously generated random numbers to locate the seven positions within each HMU where quadrates were to be placed. Upon placement of each quadrate, snorkel surveys were conducted to locate and identify any freshwater mussel species present. A SCUBA survey was conducted to sample deep-water habitats

where snorkeling methods were not possible or ineffective. Using this method, as well as visual observations during the mapping surveys, no mussel populations were noted.

Total Fish Density by Site

Table 1: Records of numbers of grids sampled per site with corresponding data on area sampled, number of fish caught and fish density.

Site	Grids Sampled	Area Sampled (m²)	No. of Fish (all species)	Density (fish/m²)
1	16	96	236	2.5
2	27	162	723	4.5
3	19	114	404	3.5
4	30	180	148	0.8
5	21	126	230	1.8
6	20	120	451	3.8
7	20	120	270	2.3
8	n.d.	n.d.	n.d.	n.d.
9	25	150	229	1.5
10	22	132	217	1.6
Totals	200	1200	2908	

Fish Density by Site

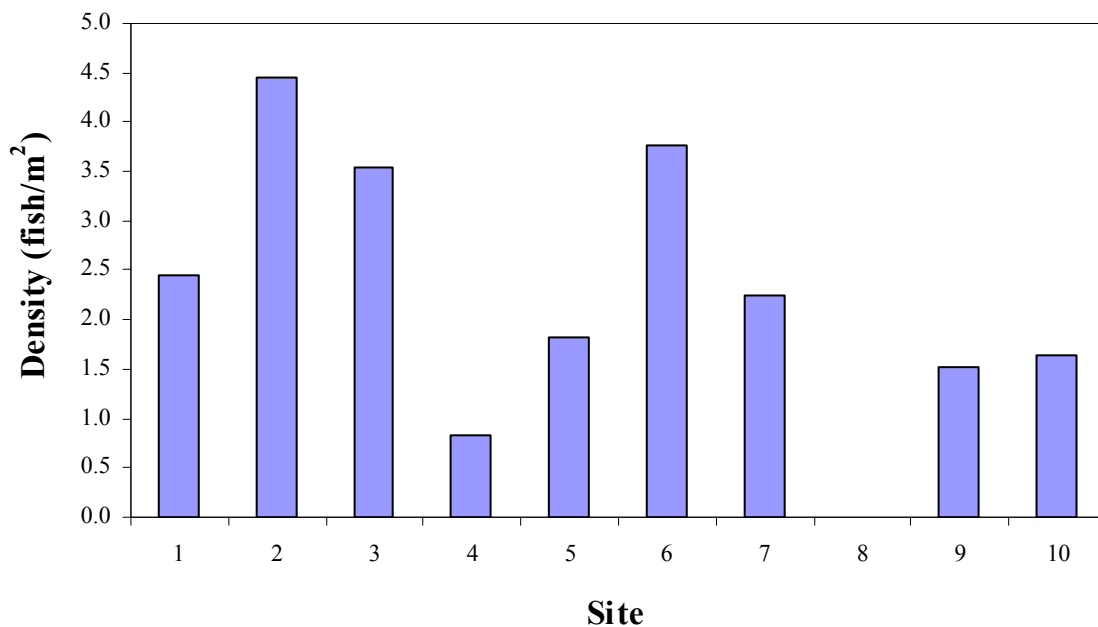


Figure 1: Fish density in fish per m2 for each site surveyed on the Pomperaug River.

Pomperaug species composition

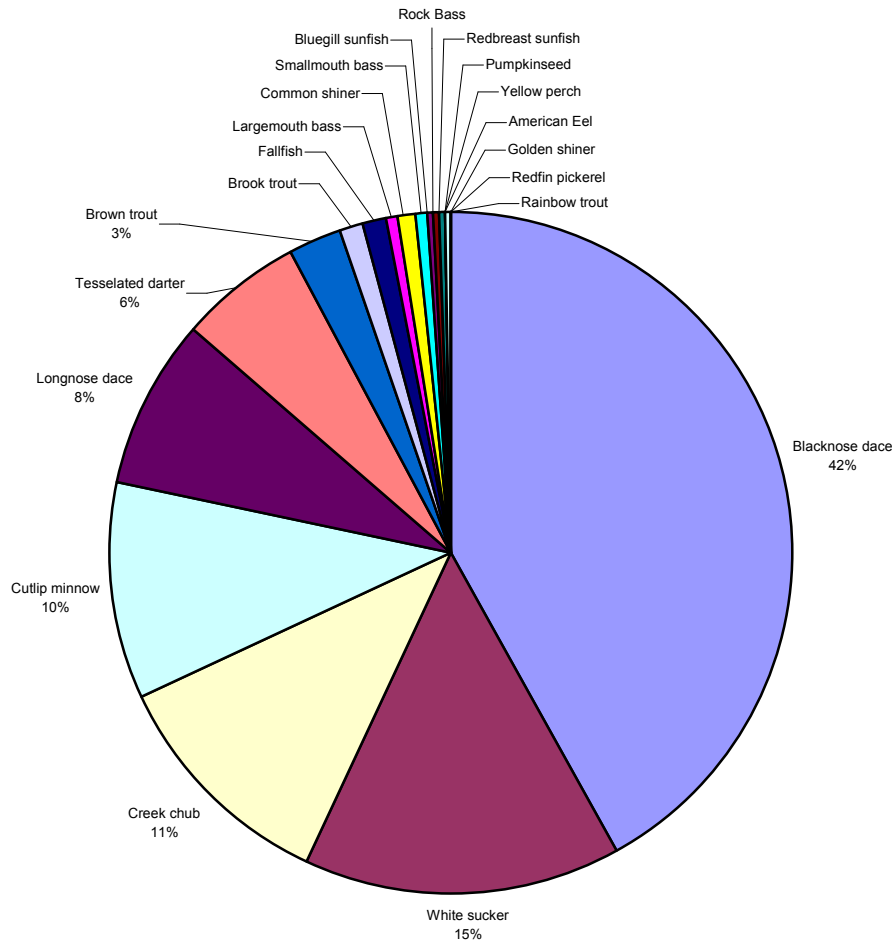


Figure 2: Sampled fish species composition (all sites) in the Pomperaug River.

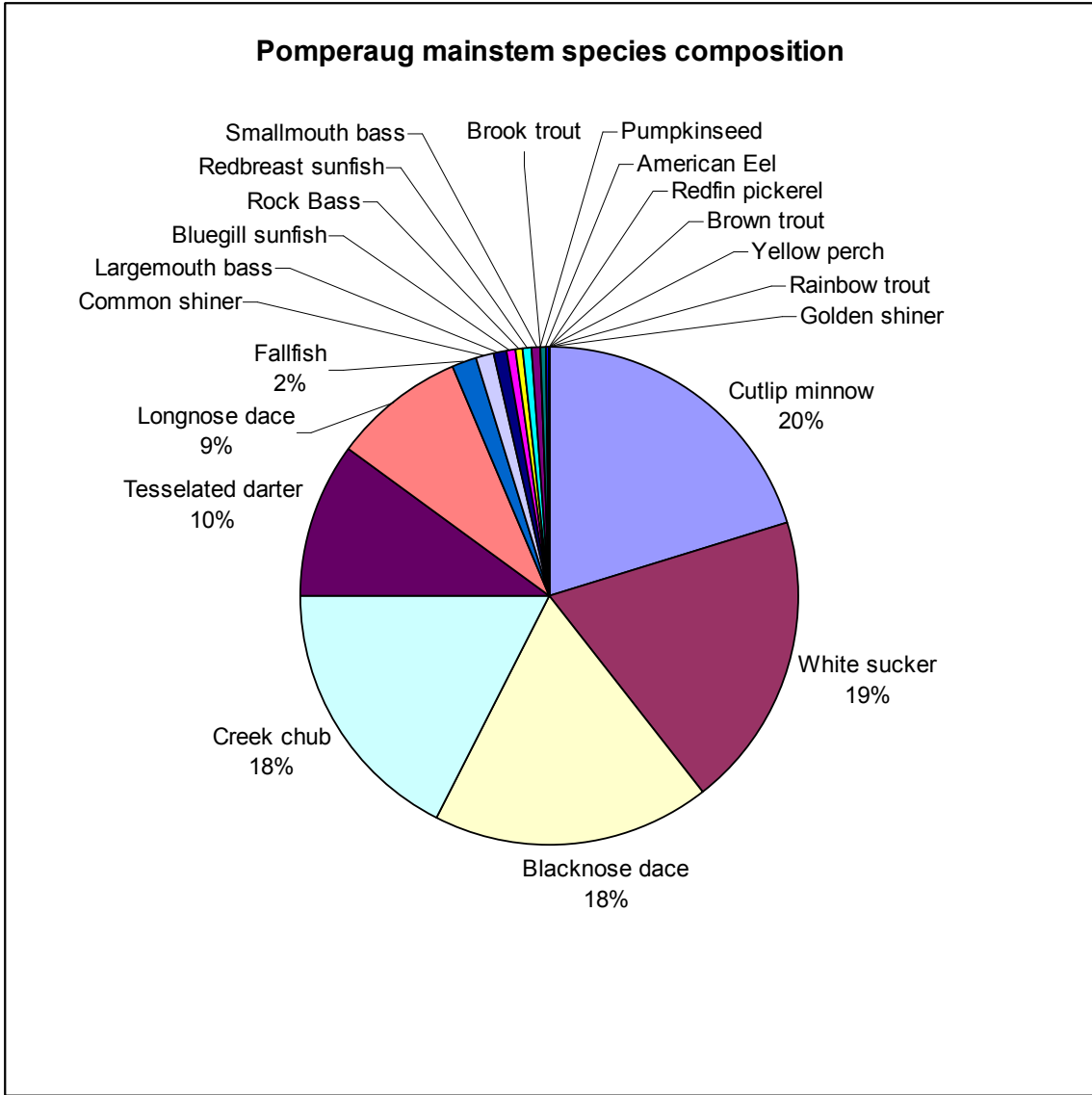


Figure 3: Sampled fish species composition of the sites located on the main stem of the Pomperaug River.

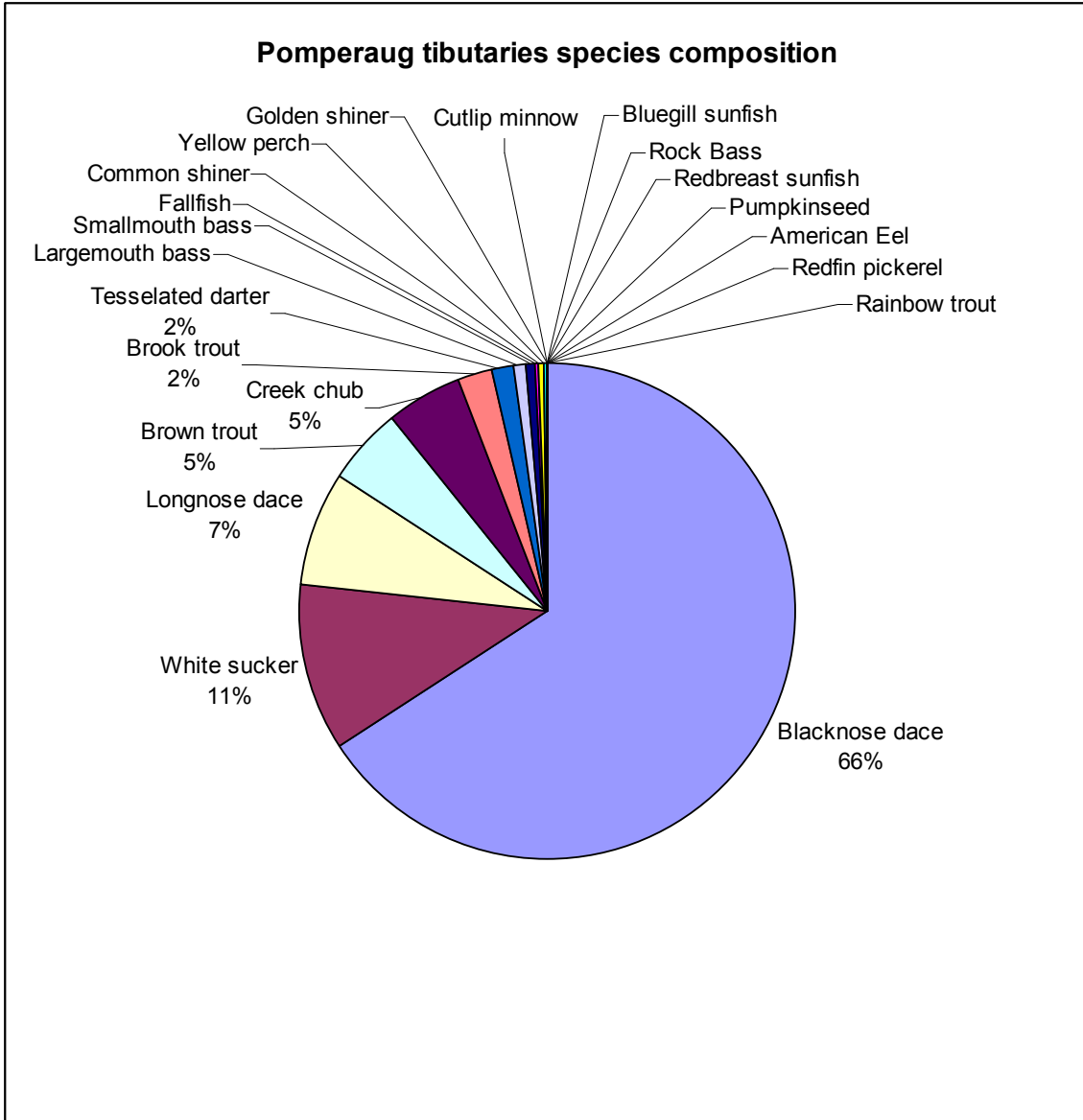


Figure 4: Sampled fish species composition of the sites located on the tributaries of the Pomperaug River.

Site One Fish Density (Individuals per meter²)

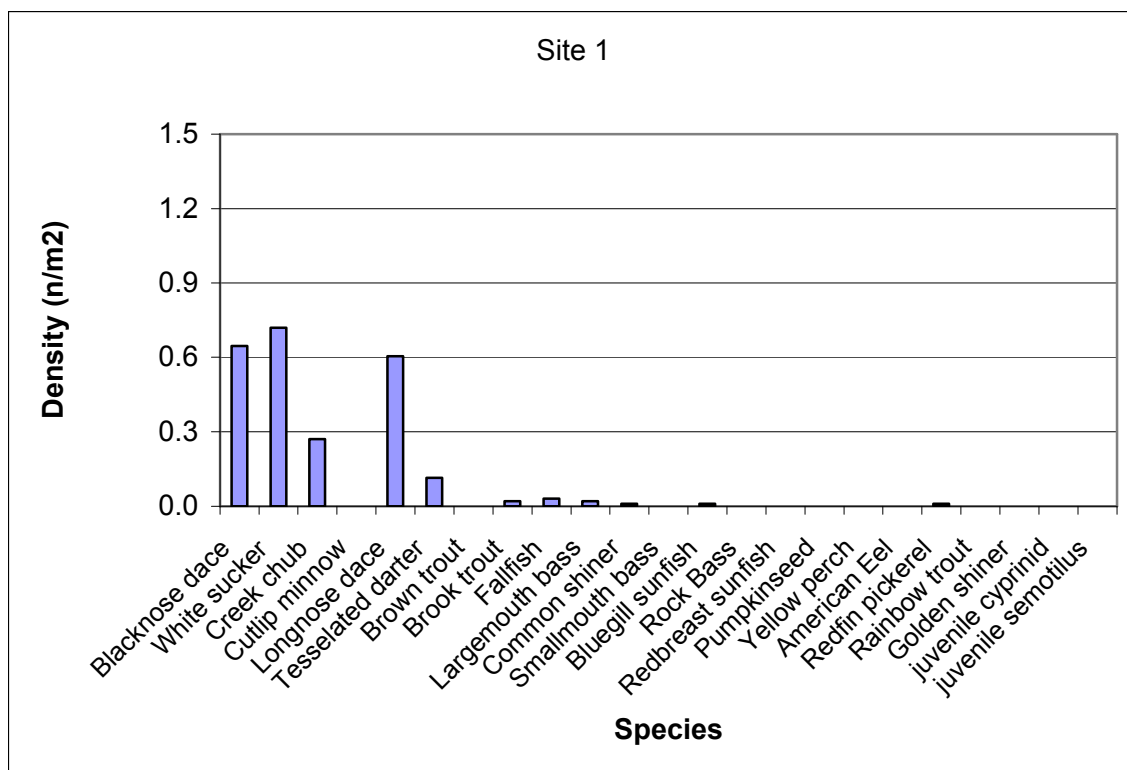


Figure 5: Bar chart of fish density in animals per square meter sampled in site 1.

Table 2: Records of fish species caught in site 1. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m ²
		Minimum (mm)	Maximum (mm)	Average (mm)	
White sucker	69	30	90	44	0.72
Blacknose dace	62	20	78	48.5	0.65
Longnose dace	58	25	103	51	0.60
Creek chub	26	33	98	51	0.27
Tesselated darter	11	21	47	40	0.11
Fallfish	3	47	80	68	0.03
Brook trout	2	86	96	91	0.02
Largemouth bass	2	68	86	77	0.02
Bluegill sunfish	1	142	142	142	0.01
Common shiner	1	66	66	66	0.01
Redfin pickerel	1	161	162	162	0.01

Site Two Fish Density (Individuals per meter²)

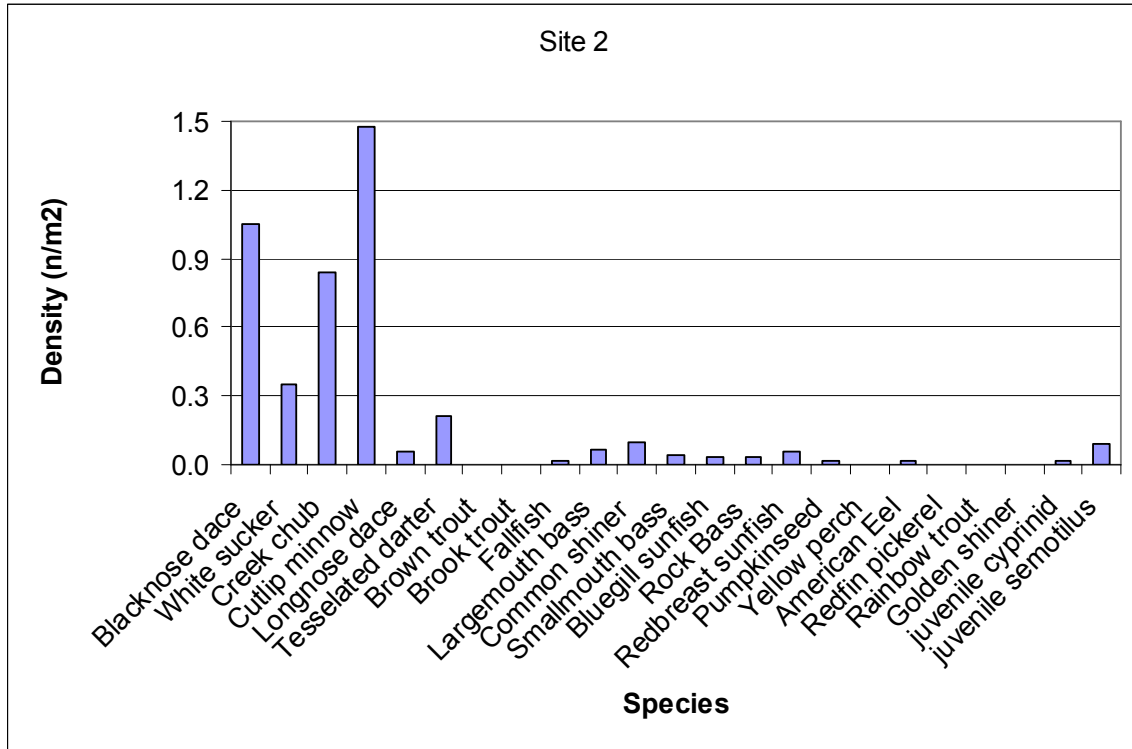


Figure 6: Bar chart of fish density in animals per square meter sampled in site 2.

Table 3: Records of fish species caught in site 2. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m2
		Minimum (mm)	Maximum (mm)	Average (mm)	
Cutlip minnow	239	18	132	73	1.48
Blacknose dace	170	20	215	47	1.05
Creek chub	136	15	124	43	0.84
White sucker	57	36	143	59	0.35
Tessellated darter	34	25	69	42	0.21
Common shiner	16	45	92	74	0.10
Juvenile semotilus	15	31	48	39	0.09
Largemouth bass	11	50	257	95	0.07
Longnose dace	9	45	74	60	0.06
Redbreast sunfish	9	70	170	115	0.06
Smallmouth bass	7	38	125	58	0.06
Bluegill	5	66	127	96	0.04
Rock Bass	5	31	148	118	0.03
Pumpkinseed	3	80	110	98	0.03
American Eel	2	510	570	540	0.02
Fallfish	2	32	34	33	0.01
Juvenile cyprinid	2	21	22	22	0.01

**Site Three Fish Density
(Individuals per meter²)**

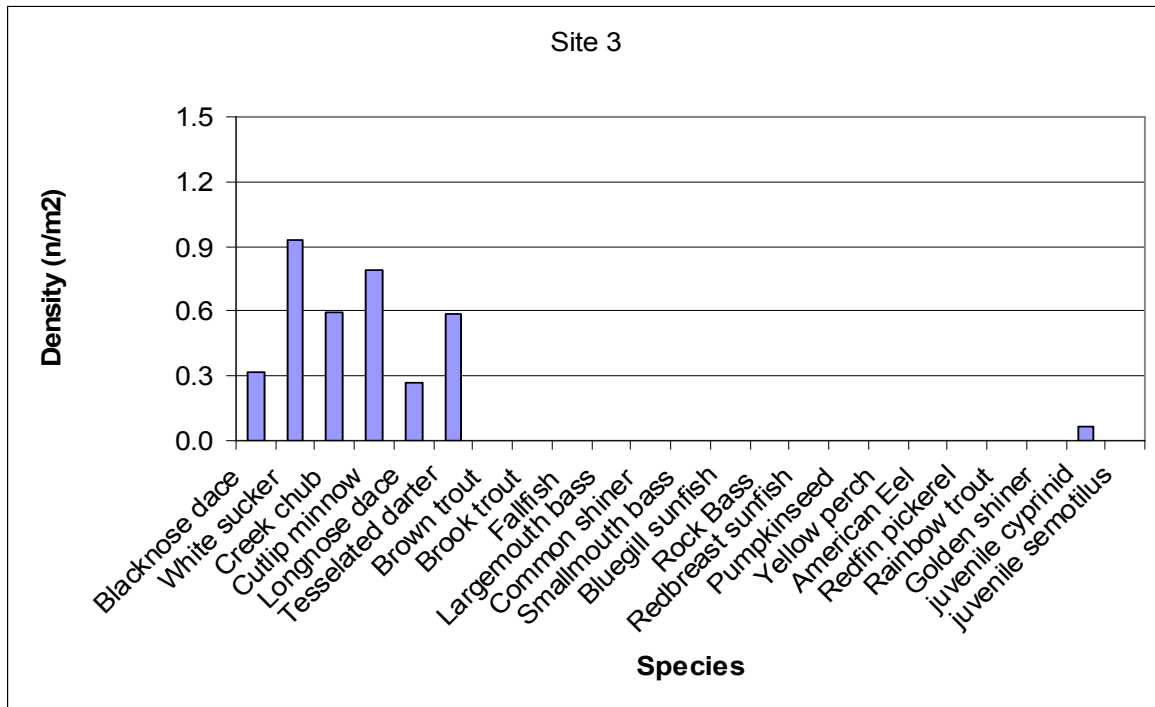


Figure 7: Bar chart of fish density in animals per square meter sampled in site 3.

Table 4: Records of fish species caught in site 3. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m2
		Minimum (mm)	Maximum (mm)	Average (mm)	
White sucker	106	26	60	41	0.93
Cutlip minnow	90	22	113	52	0.79
Creek chub	68	17	82	39	0.60
Tesselated darter	67	25	52	39	0.59
Blacknose dace	36	18	72	38	0.32
Longnose dace	31	30	80	49	0.27
Juvenile Cyprinid	7	19	39	23	0.06

**Site Four Fish Density
(Individuals per meter²)**

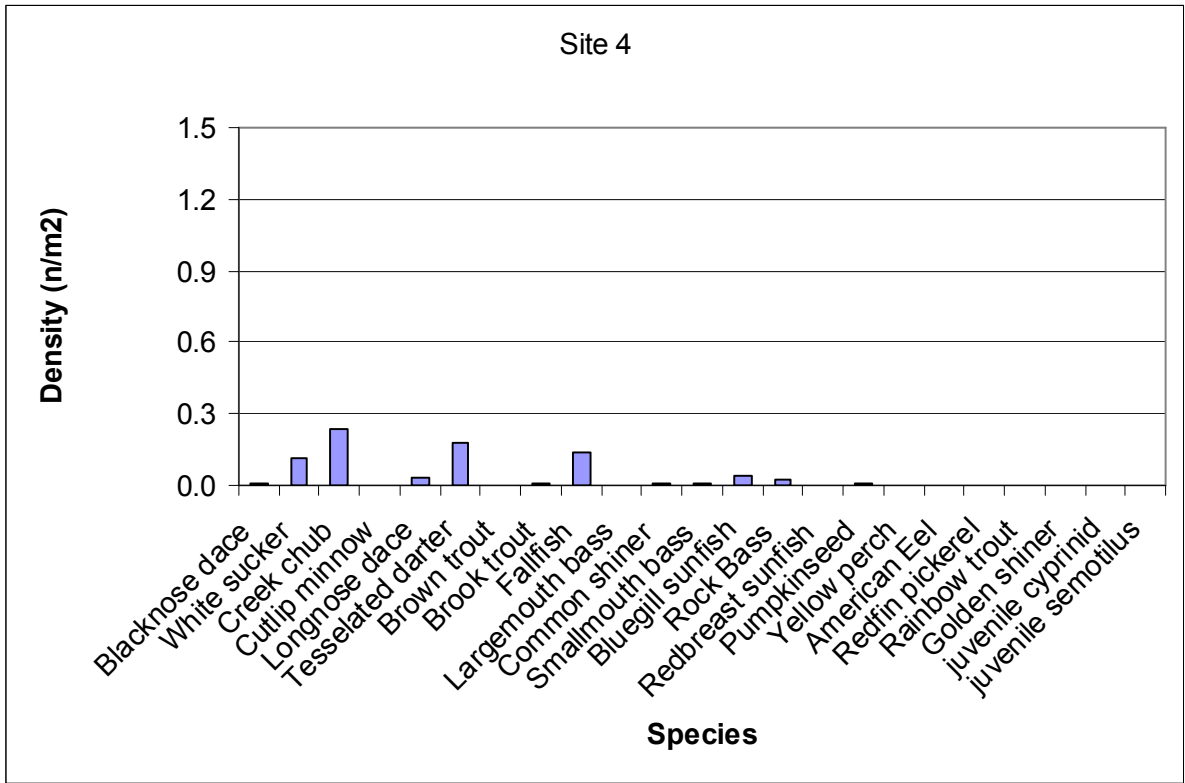


Figure 8: Bar chart of fish density in animals per square meter sampled in site 4.

Table 5: Records of fish species caught in site 4. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m2
		Minimum (mm)	Maximum (mm)	Average (mm)	
Creek chub	43	30	100	44	0.24
Tesselated darter	32	20	64	37	0.18
Fallfish	25	31	98	51	0.14
White sucker	21	40	59	50	0.12
Bluegill sunfish	7	31	42	37	0.04
Longnose dace	6	47	96	70	0.03
Rock Bass	5	155	186	173	0.03
Common shiner	2	50	76	63	0.01
Smallmouth bass	2	40	125	83	0.01
Blacknose dace	1	1	1	1	0.01
Brook trout	1	310	310	310	0.01
Pumpkinseed	1	59	59	59	0.01

**Site Five Fish Density
(Individuals per meter²)**

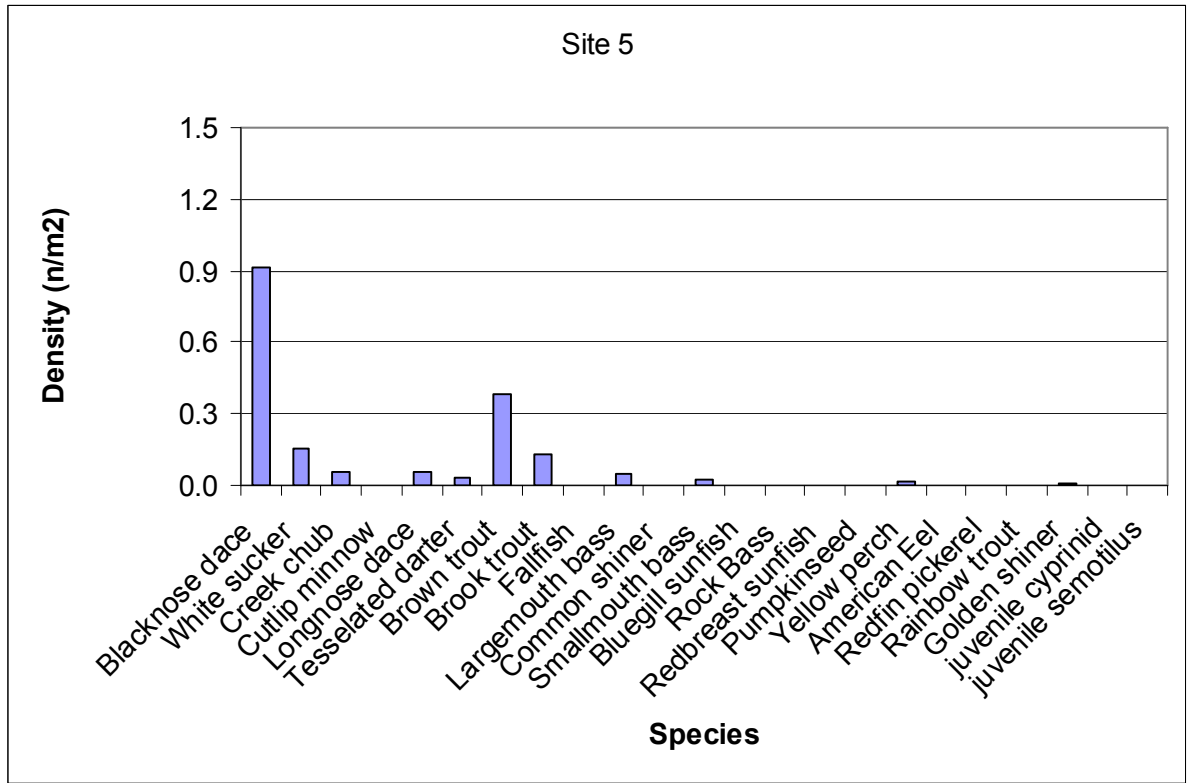


Figure 9: Bar chart of fish density in animals per square meter sampled in site 5.

Table 6: Records of fish species caught in site 5. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m2
		Minimum (mm)	Maximum (mm)	Average (mm)	
Blacknose dace	115	29	83	54	0.91
Brown trout	48	62	240	84	0.38
White sucker	20	36	76	59	0.16
Brook trout	16	63	221	143	0.13
Creek chub	7	41	98	73	0.06
Longnose dace	7	43	105	62	0.06
Largemouth bass	6	40	103	74	0.05
Tesselated darter	4	43	71	55	0.03
Smallmouth bass	3	52	74	66	0.02
Yellow perch	2	140	147	144	0.02
Bluegill	1	65	65	65	0.01
Golden shiner	1	132	132	132	0.01

Site Six Fish Density (Individuals per meter²)

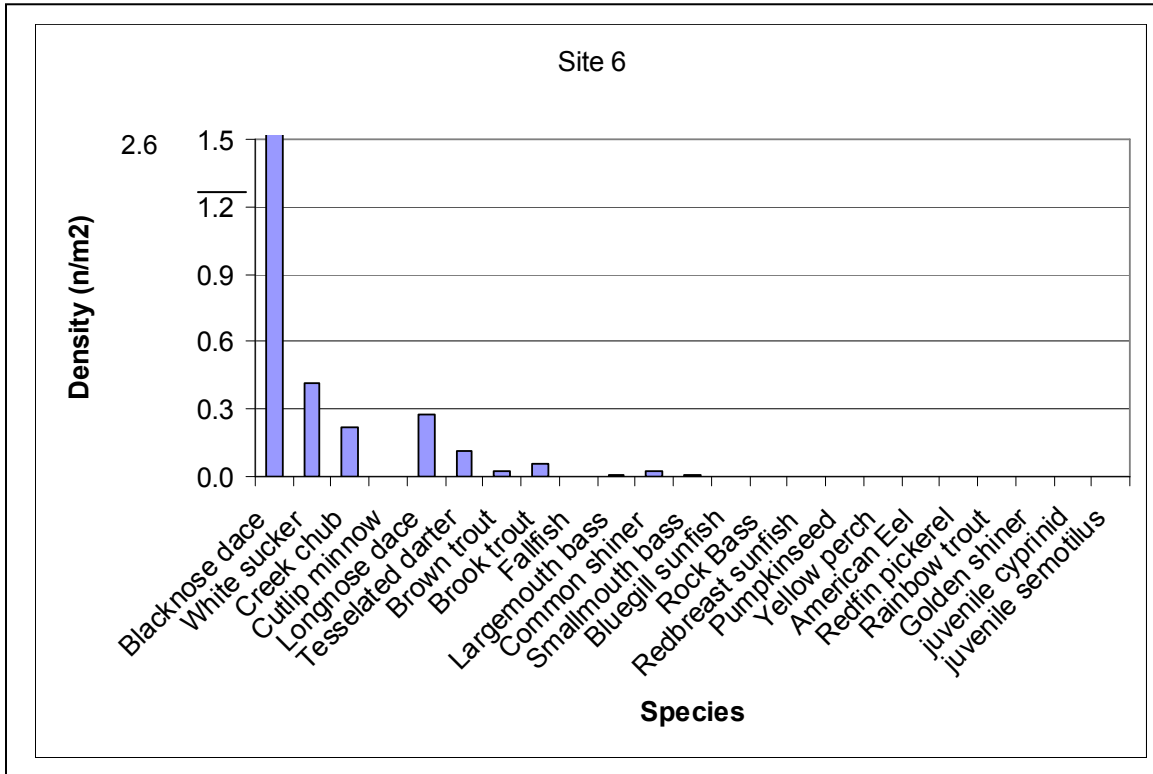


Figure 10: Bar chart of fish density in animals per square meter sampled in site 6.

Table 7: Records of fish species caught in site 6. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m2
		Minimum (mm)	Maximum (mm)	Average (mm)	
Blacknose dace	313	20	81	55	2.61
White sucker	50	24	143	46	0.42
Longnose dace	33	38	115	68	0.28
Creek chub	26	33	136	77	0.22
Tesselated darter	14	15	74	74	0.12
Brook trout	7	75	163	110	0.06
Brown trout	3	78	162	112	0.03
Common shiner	3	66	66	66	0.03
Largemouth bass	1	58	58	58	0.01
Smallmouth bass	1	57	57	57	0.01

**Site Seven Fish Density
(Individuals per meter²)**

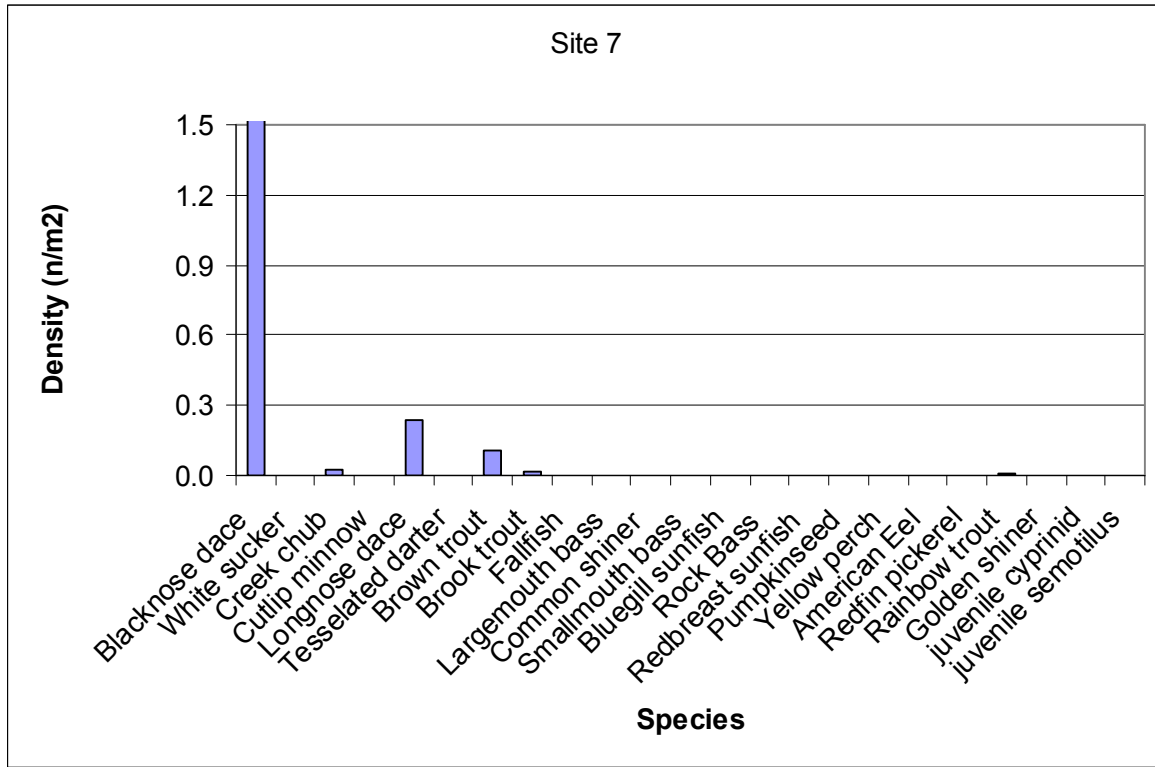


Figure 11: Bar chart of fish density in animals per square meter sampled in site 7.

Table 8: Records of fish species caught in site 7. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m2
		Minimum (mm)	Maximum (mm)	Average (mm)	
Blacknose dace	187	24	85	54	1.56
White sucker	35	36	111	49	0.29
Longnose dace	28	37	92	65	0.23
Brown trout	13	81	267	147	0.11
Creek chub	3	38	49	45	0.03
Brook trout	2	86	179	133	0.02
Smallmouth bass	1	50	50	50	0.01
Rainbow trout	1	304	304	304	0.01

**Site Nine Fish Density
(Individuals per meter²)**

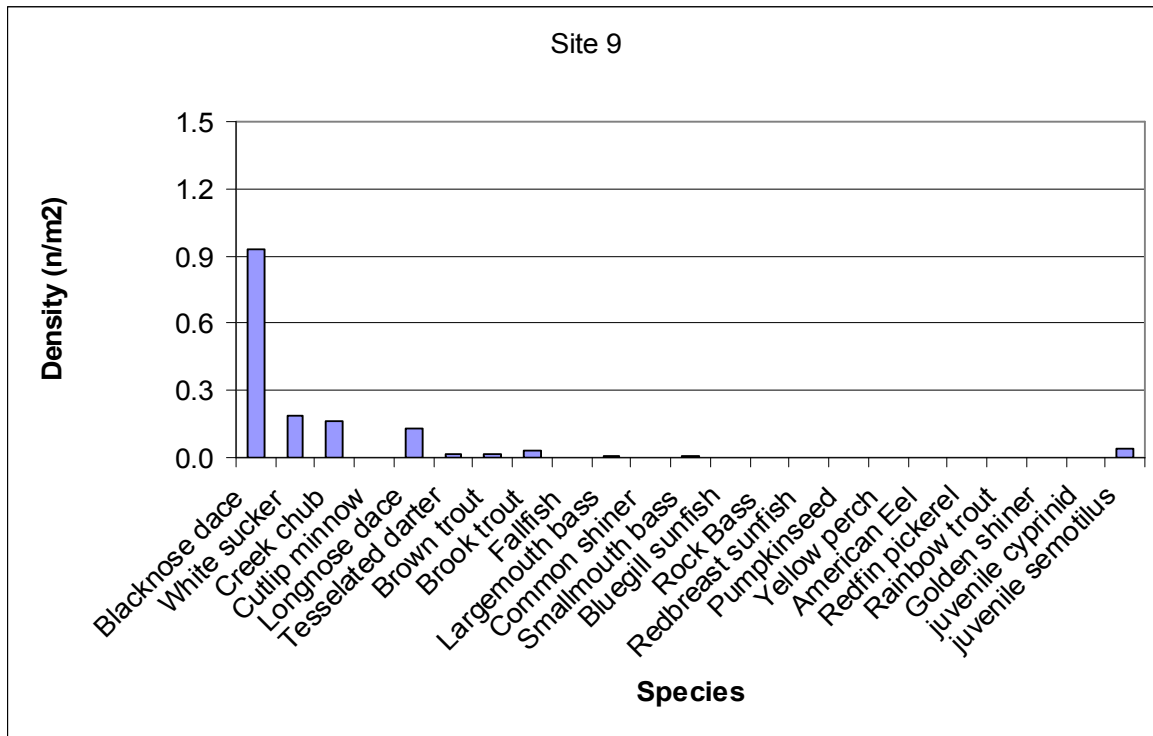


Figure 12: Bar chart of fish density in animals per square meter sampled in site 9.

Table 9: Records of fish species caught in site 9. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m2
		Minimum (mm)	Maximum (mm)	Average (mm)	
Blacknose dace	140	21	82	49	0.93
White sucker	28	39	107	55	0.19
Creek chub	24	32	77	44	0.16
Longnose dace	19	45	103	71	0.13
Juvenile semotilus	6	25	38	34	0.04
Brook trout	5	66	136	88	0.03
Brown trout	2	172	197	185	0.01
Tessellated darter	2	40	50	45	0.01
Largemouth bass	1	52	52	52	0.01
Smallmouth bass	1	48	48	48	0.01
Young of the Year	1	20	20	20	0.01

**Site Ten Fish Density
(Individuals per meter²)**

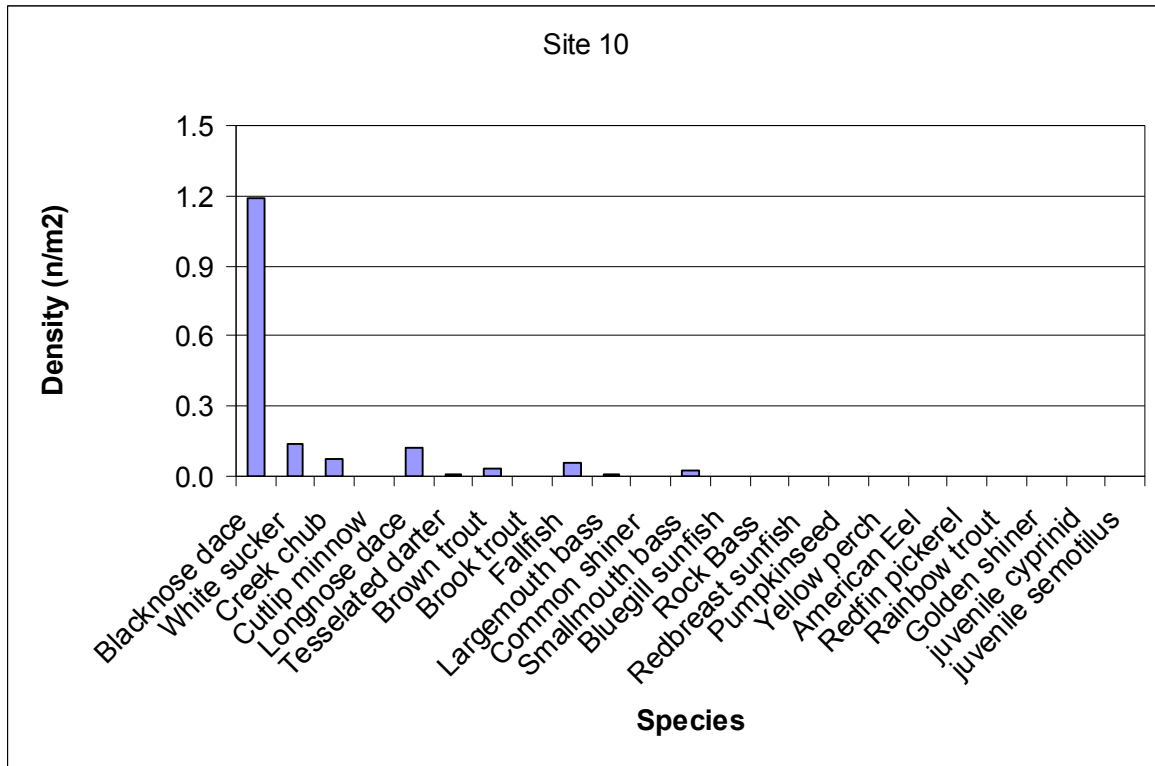


Figure 13: Bar chart of fish density in animals per square meter sampled in site 10.

Table 10: Records of fish species caught in site 10. Table includes statistics on species size distribution and density per square meter.

Species	Abundance	Size Distribution			Density per m ²
		Minimum (mm)	Maximum (mm)	Average (mm)	
Blacknose dace	157	12	81	44	1.2
White sucker	18	44	63	52	0.1
Longnose dace	16	27	98	53	0.1
Creek chub	10	32	175	51	0.1
Fallfish	7	47	55	51	0.1
Brown trout	4	79	193	140	0.0
Smallmouth bass	3	34	56	43	0.0
Largemouth bass	1	36	36	36	0.0
Tessellated darter	1	51	51	51	0.0