

**SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY**  
**Spearfish Creek, Lawrence County**  
**09-0021-00**  
**1998**

Table 1. Population and Biomass Estimates for Spearfish Creek

<b>Site Number:</b> 106	<b>Date Sampled:</b> 08/20/1998	<b>Conductivity (umhos/cm):</b> 505
<b>Site Midpoint (Latitude, Longitude):</b> 44.54242535, -103.87466783	<b>Site Length (m):</b> 100	<b>pH:</b> 8.4
<b>Survey Completed by:</b> South Dakota Game, Fish and Parks	<b>Mean Width (m):</b> 8.4	<b>Water Temperature (C):</b> 12.5
<b>Stream Classification:</b> BR1	<b>Number of Pass:</b> 3	<b>Voltage:</b> 200

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	122	160	197	123	1905	20	1600	771	18.02	2574	88.3	10.6
Brown Trout	>=200mm	56	97	170	56	1155	198	970	468	176.75	1561	252.0	171.4
Brown Trout	All	242	375	478	272	4464	273	3750	1808	243.93	6034	139.8	61.2
Longnose Dace	All	1	1	2	1	12	0	10	5	0.23	16	127.0	22.0

<b>Site Number:</b> 130	<b>Date Sampled:</b> 08/19/1998	<b>Conductivity (umhos/cm):</b> 476
<b>Site Midpoint (Latitude, Longitude):</b> 44.53105790, -103.86894580	<b>Site Length (m):</b> 100	<b>pH:</b> 8.6
<b>Survey Completed by:</b> South Dakota Game, Fish and Parks	<b>Mean Width (m):</b> 10.5	<b>Water Temperature (C):</b> 12.8
<b>Stream Classification:</b> BR1	<b>Number of Pass:</b> 3	<b>Voltage:</b> 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	137	326	609	137	3099	26	3260	1255	23.12	5245	85.9	8.4
Brown Trout	>=200mm	28	53	121	28	504	128	530	204	114.21	853	288.9	253.9
Brown Trout	All	340	385	412	358	3660	183	3850	1482	163.46	6195	120.3	50.0
Longnose Dace	All	43	42	56	43	399	2	420	162	1.41	676	76.7	3.9

Longnose Sucker	All	146	164	181	147	1559	30	1640	631	27.23	2639	80.3	19.6
White Sucker	All	26	25	33	26	238	26	250	96	23.36	402	153.0	110.1

**Site Number:** 190  
**Site Midpoint (Latitude, Longitude):** 44.48929462, -103.86435821  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BR1

**Date Sampled:** 10/14/1998  
**Site Length (m):** 98  
**Mean Width (m):** 7.3  
**Number of Pass:** 3

**Conductivity (umhos/cm):** 444  
**pH:** 7.4  
**Water Temperature (C):** 6.9  
**Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	83	92	103	83	1253	22	939	508	19.38	1510	104.0	17.3
Brown Trout	>=200mm	205	219	231	207	2984	540	2235	1208	482.41	3596	254.5	181.1
Brown Trout	All	288	312	329	295	4251	569	3184	1722	508.14	5123	211.1	133.9

**Site Number:** 205  
**Site Midpoint (Latitude, Longitude):** 44.47880965, -103.85669154  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BK0, BR1, RB0

**Date Sampled:** 10/14/1998  
**Site Length (m):** 109  
**Mean Width (m):** 13.0  
**Number of Pass:** 3

**Conductivity (umhos/cm):** 422  
**pH:** 7.3  
**Water Temperature (C):** 7.4  
**Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brook Trout	<200mm	1	1	2	1	8	0	9	3	0.16	15	138.0	24.0
Brook Trout	All	1	1	2	1	8	0	9	3	0.16	15	138.0	24.0
Brown Trout	<200mm	125	124	141	125	954	22	1138	386	19.47	1830	121.4	22.9
Brown Trout	>=200mm	144	147	152	144	1131	195	1349	458	174.16	2170	253.5	172.5
Brown Trout	All	507	540	558	522	4154	426	4954	1682	380.53	7971	192.1	102.6
Rainbow Trout	<200mm	1	1	1	1	8	0	9	3	0.01	15	62.0	1.0
Rainbow Trout	All	1	1	1	1	8	0	9	3	0.01	15	62.0	1.0

**Site Number:** 267  
**Site Midpoint (Latitude, Longitude):** 44.44302811, -103.87090671  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BR3

**Date Sampled:** 06/29/1998      **Conductivity (umhos/cm):** 308  
**Site Length (m):** 100      **pH:** 8.5  
**Mean Width (m):** 5.9      **Water Temperature (C):** 14.0  
**Number of Pass:** 5      **Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	36	37	41	36	629	29	370	255	26.11	595	158.8	46.5
Brown Trout	>=200mm	3	3	3	3	51	6	30	21	5.27	48	226.7	115.7
Brown Trout	All	39	40	44	39	680	35	400	276	31.63	644	164.0	52.1

**Site Number:** 302  
**Site Midpoint (Latitude, Longitude):** 44.42277948, -103.88089090  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BK3, BR1, RB2

**Date Sampled:** 06/26/1998      **Conductivity (umhos/cm):** 304  
**Site Length (m):** 110      **pH:** 8.5  
**Mean Width (m):** 8.1      **Water Temperature (C):** 12.8  
**Number of Pass:** 3      **Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brook Trout	<200mm	10	10	10	10	123	5	91	50	4.19	146	159.7	38.2
Brook Trout	>=200mm	5	5	5	5	61	5	45	25	4.53	73	207.4	82.6
Brook Trout	All	15	15	15	15	184	10	136	75	8.90	219	175.6	54.1
Brown Trout	<200mm	258	278	293	263	3415	138	2527	1383	123.40	4066	150.8	40.5
Brown Trout	>=200mm	96	113	132	96	1388	194	1027	562	173.25	1653	240.3	139.8
Brown Trout	All	354	391	413	369	4803	323	3555	1945	288.19	5719	175.1	67.2
Rainbow Trout	>=200mm	1	1	1	1	12	1	9	5	1.18	15	225.0	108.0
Rainbow Trout	All	1	1	1	1	12	1	9	5	1.18	15	225.0	108.0

**Site Number:** 418  
**Site Midpoint (Latitude, Longitude):** 44.36357703, -103.92915307  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BK3, BR1

**Date Sampled:** 06/17/1998      **Conductivity (umhos/cm):** 435  
**Site Length (m):** 105  
**Mean Width (m):** 8.5      **pH:** 8.6  
**Number of Pass:** 3      **Water Temperature (C):** 8.6  
**Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brook Trout	>=200mm	1	1	1	1	12	1	10	5	1.09	15	209.0	104.0
Brook Trout	All	1	1	1	1	12	1	10	5	1.09	15	209.0	104.0
Brown Trout	<200mm	111	137	164	111	1612	63	1305	653	56.66	2099	141.8	39.4
Brown Trout	>=200mm	60	70	84	60	824	118	667	334	105.60	1073	230.7	143.6
Brown Trout	All	171	210	242	178	2471	188	2000	1001	167.53	3218	173.0	75.9

**Site Number:** 477  
**Site Midpoint (Latitude, Longitude):** 44.33239689, -103.90206721  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BR1

**Date Sampled:** 06/16/1998      **Conductivity (umhos/cm):** 409  
**Site Length (m):** 100  
**Mean Width (m):** 6.9      **pH:** 8.6  
**Number of Pass:** 3      **Water Temperature (C):** 11.4  
**Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	77	243	679	77	3542	91	2430	1435	81.21	3910	122.2	25.7
Brown Trout	>=200mm	38	42	50	38	612	92	420	248	82.21	676	242.9	150.4
Brown Trout	All	115	194	289	115	2828	189	1940	1145	168.89	3121	162.1	66.9

**Site Number:** 494  
**Site Midpoint (Latitude, Longitude):** 44.32300050, -103.89352153  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BR1

**Date Sampled:** 06/16/1998      **Conductivity (umhos/cm):** 426  
**Site Length (m):** 93  
**Mean Width (m):** 8.5      **pH:** 8.7  
**Number of Pass:** 3      **Water Temperature (C):** 9.8  
**Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	201	211	220	202	2482	68	2269	1005	60.62	3651	129.7	27.4
Brown Trout	>=200mm	31	32	35	31	376	46	344	152	41.19	554	227.5	122.5
Brown Trout	All	232	244	254	234	2871	115	2624	1163	102.84	4221	142.8	40.1

Site Number: 508

Site Midpoint (Latitude, Longitude): 44.31483138, -103.88577053

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BR1

Date Sampled: 06/15/1998

Site Length (m): 105

Mean Width (m): 8.5

Number of Pass: 3

Conductivity (umhos/cm): 423

pH: 8.6

Water Temperature (C): 10.7

Voltage: 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	157	198	233	163	2329	78	1886	943	69.97	3034	137.4	33.6
Brown Trout	>=200mm	119	145	171	119	1706	241	1381	691	215.45	2222	241.8	141.5
Brown Trout	All	276	346	391	301	4071	326	3295	1649	291.22	5302	182.4	80.1

Site Number: 524

Site Midpoint (Latitude, Longitude): 44.30721114, -103.87356822

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BR1

Date Sampled: 06/15/1998

Site Length (m): 104

Mean Width (m): 5.7

Number of Pass: 3

Conductivity (umhos/cm): 440

pH: 8.6

Water Temperature (C): 7.2

Voltage: 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	248	296	328	264	5230	122	2846	2118	109.16	4579	118.4	23.4
Brown Trout	>=200mm	67	80	97	67	1413	173	769	572	154.27	1238	229.8	122.2
Brown Trout	All	317	384	424	344	6784	302	3692	2748	269.39	5941	142.1	44.5

**Site Number:** 532  
**Site Midpoint (Latitude, Longitude):** 44.30123680, -103.87015359  
**Survey Completed by:** South Dakota Game, Fish and Parks  
**Stream Classification:** BR1

**Date Sampled:** 06/12/1998      **Conductivity (umhos/cm):** 432  
**Site Length (m):** 105      **pH:** 8.6  
**Mean Width (m):** 7.0      **Water Temperature (C):** 10.7  
**Number of Pass:** 3      **Voltage:** 250

Species	Size Class	Total Number Captured	Est. # in site	Upper 95% CI	Lower 95% CI	# per Hectacre	Kg per Hectacre	# per Km	# per Acre	lb. per Acre	# per Mile	Mean Length (mm)	Mean Weight (grams)
Brown Trout	<200mm	141	155	169	141	2202	57	1476	892	50.69	2375	125.1	25.8
Brown Trout	>=200mm	31	35	44	31	497	53	333	201	47.16	536	222.5	106.2
Brown Trout	All	174	196	214	178	2784	111	1867	1128	99.19	3003	142.7	39.9

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Stream sites are classified based on the estimates of adult trout over eight inches that exist within the site. Estimates are derived from 3-pass backpack electrofishing surveys at 100-meter sites within streams. While all fish in the site are collected and measured, only trout species are used for classifications. Sites are numbered in accordance for the distance (m) from the stream confluence of a higher order stream/river.

Based on number of trout in excess of eight inches	
<b>Class BR1</b>	Number of wild Brown Trout exceeds 150 per acre
<b>Class BR2</b>	Number of wild Brook Trout ranges from 25 to 150 per acre
<b>Class BR3</b>	Number of wild Brown Trout is less than 25 per acre
<b>Class BK1</b>	Number of wild Brook Trout exceeds 150 per acre
<b>Class BK2</b>	Number of wild Brook Trout ranges from 25 to 150 per acre
<b>Class BK3</b>	Number of wild Brook Trout is less than 25 per acre
<b>Class RB1</b>	Number of wild Rainbow Trout exceeds 25 per acre
<b>Class RB2</b>	Number of wild Rainbow Trout is less than 25 per acre

Table 2. Species composition and population estimates on Spearfish Creek, 1988-1998

**Site 106**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Aug 20, 1998	160	123-197	
Brown Trout >=200mm	Aug 20, 1998	97	56-170	BR1
Longnose Dace	Aug 20, 1998	1	1-2	

**Site 130**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Aug 19, 1998	326	137-609	
Brown Trout >=200mm	Aug 19, 1998	53	28-121	BR1
Longnose Dace	Aug 19, 1998	42	43-56	

Longnose Sucker Aug 19, 1998 164 147-181

White Sucker Aug 19, 1998 25 26-33

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**Site 190**

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<b>Species/Size</b>	<b>Date</b>	<b>Pop Est.</b>	<b>(95% C.I.)</b>	<b>Stream Classification</b>
Brown Trout <200mm	Nov 02, 1988	175	144-206	
	Jul 31, 1990	226	149-307	
	Sep 24, 1991	75	70-83	
	Oct 05, 1993	62	58-69	
	Oct 09, 1996	190	176-204	
	Oct 14, 1998	92	83-103	
Brown Trout >=200mm	Nov 02, 1988	110	68-179	BR3
	Jul 31, 1990	200	187-213	BR3
	Sep 24, 1991	220	205-235	BR3
	Oct 05, 1993	209	209-211	BR1
	Oct 09, 1996	58	53-66	BR1
	Oct 14, 1998	219	207-231	BR1

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**Site 205**

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<b>Species/Size</b>	<b>Date</b>	<b>Pop Est.</b>	<b>(95% C.I.)</b>	<b>Stream Classification</b>
Brook Trout <200mm	Oct 31, 1995	4	4-4	
	Oct 07, 1996	4	4-5	
	Oct 14, 1998	1	1-2	
Brown Trout <200mm	Nov 02, 1988	66	66-66	
	Jul 31, 1990	103	78-137	
	Sep 24, 1991	65	61-72	
	Sep 30, 1992	55	54-58	
	Oct 05, 1993	70	68-74	
	Oct 11, 1994	73	70-79	
	Oct 31, 1995	31	29-36	
	Oct 07, 1996	1085	806-1364	
	Oct 14, 1998	124	125-141	
Brown Trout >=200mm	Nov 02, 1988	56	56-56	BR3
	Jul 31, 1990	108	102-116	BR3
	Sep 24, 1991	175	132-219	BR3

Brown Trout >=200mm	Sep 30, 1992	95	93-99	BR1
	Oct 05, 1993	99	98-102	BR1
	Oct 11, 1994	82	82-84	BR1
	Oct 31, 1995	68	68-69	BR1
	Oct 07, 1996	60	61-72	BR1
	Oct 14, 1998	147	144-152	BR1
Rainbow Trout <200mm	Nov 02, 1988	4	4-4	
	Oct 11, 1994	1	1-2	
	Oct 31, 1995	8	4-42	
	Oct 07, 1996	6	6-7	
	Oct 14, 1998	1	1-1	
Rainbow Trout >=200mm	Nov 02, 1988	3	3-3	RB2
	Jul 31, 1990	15	12-27	RB2
	Sep 24, 1991	11	11-12	RB2
	Sep 30, 1992	2	2-2	RB2
	Oct 31, 1995	1	1-1	RB2

**Site 267**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Jun 29, 1998	37	36-41	
Brown Trout >=200mm	Jun 29, 1998	3	3-3	BR3

**Site 302**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Jun 26, 1998	10	10-10	
Brook Trout >=200mm	Jun 26, 1998	5	5-5	BK3
Brown Trout <200mm	Jun 26, 1998	278	263-293	
Brown Trout >=200mm	Jun 26, 1998	113	96-132	BR1
Rainbow Trout >=200mm	Jun 26, 1998	1	1-1	RB2

**Site 418**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout >=200mm	Jun 17, 1998	1	1-1	BK3
Brown Trout <200mm	Jun 17, 1998	137	111-164	
Brown Trout >=200mm	Jun 17, 1998	70	60-84	BR1

**Site 477**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Jun 16, 1998	243	77-679	
Brown Trout >=200mm	Jun 16, 1998	42	38-50	BR1

**Site 494**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Jun 16, 1998	211	202-220	
Brown Trout >=200mm	Jun 16, 1998	32	31-35	BR1

**Site 508**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Sep 27, 1991	168	149-187	
	Jun 15, 1998	198	163-233	
Brown Trout >=200mm	Sep 27, 1991	96	94-100	BR3
	Jun 15, 1998	145	119-171	BR1

**Site 524**

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brown Trout <200mm	Jun 15, 1998	296	264-328	
Brown Trout >=200mm	Jun 15, 1998	80	67-97	BR1

**Site 532**

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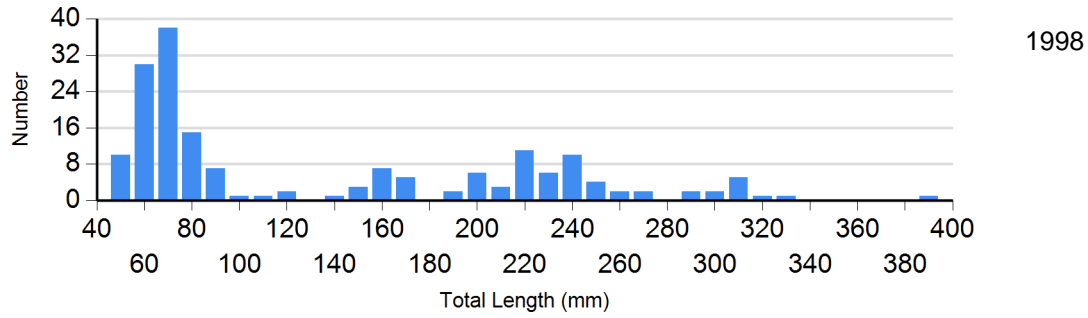
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Brown Trout <200mm	Jun 12, 1998	155	141-169	
Brown Trout >=200mm	Jun 12, 1998	35	31-44	BR1

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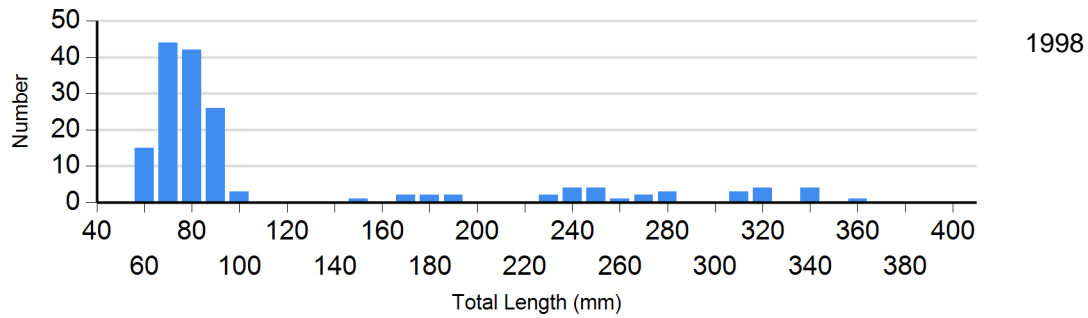
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

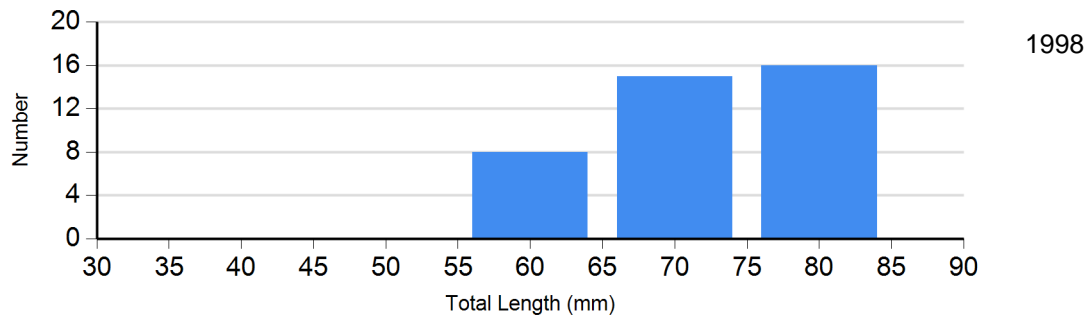
**Site:** 106  
**Species:** Brown Trout



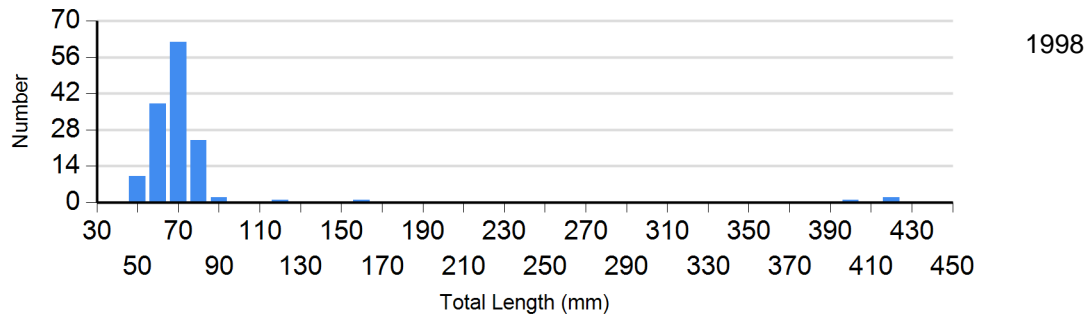
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**Species:** Brown Trout



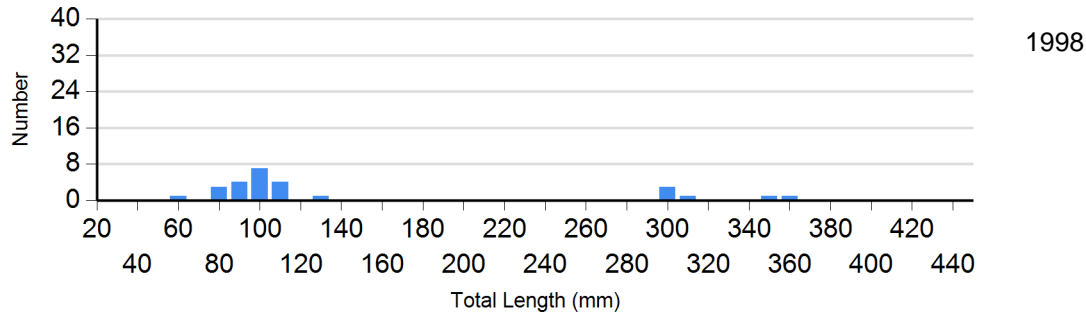
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**Species:** Longnose Dace



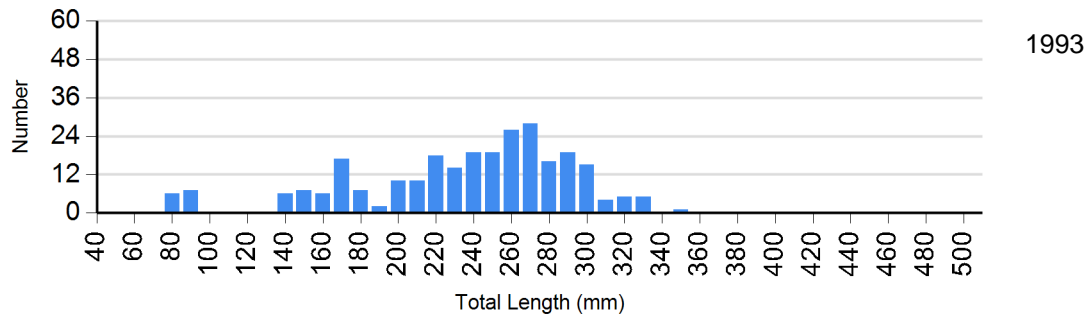
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**Species:** Longnose Sucker

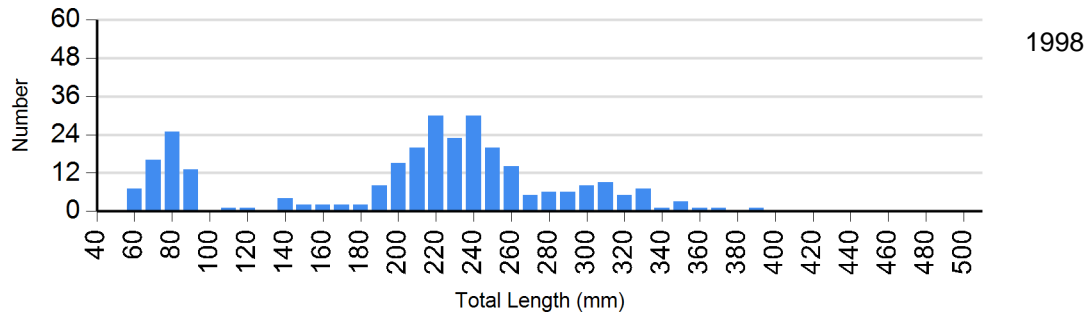
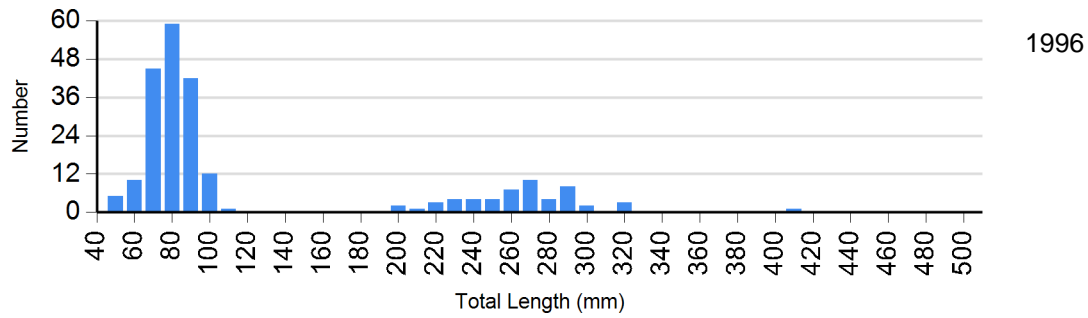


**Site:** 130  
**Species:** White Sucker

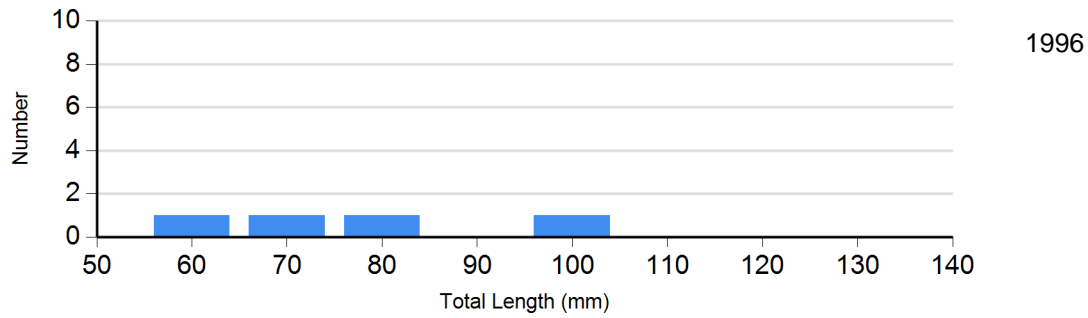
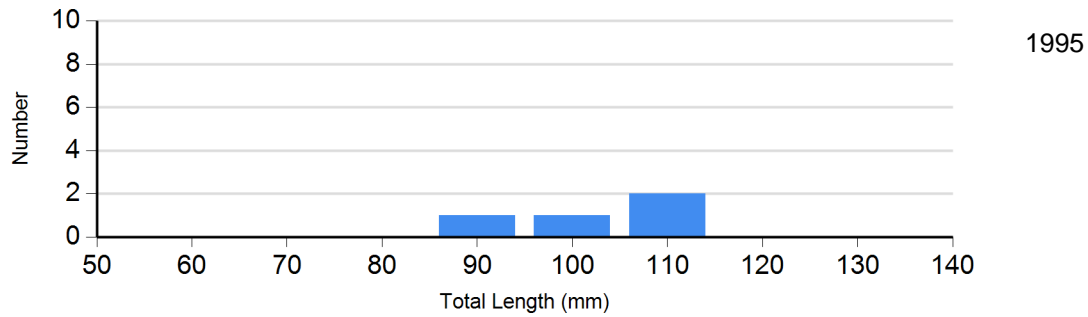


**Site:** 190  
**Species:** Brown Trout



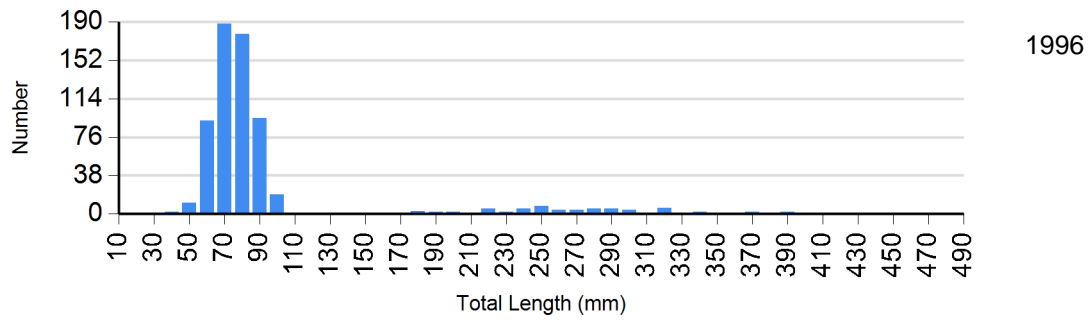
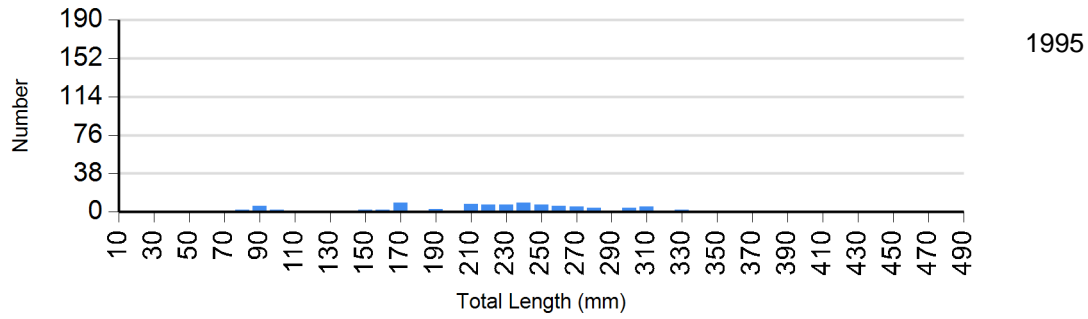
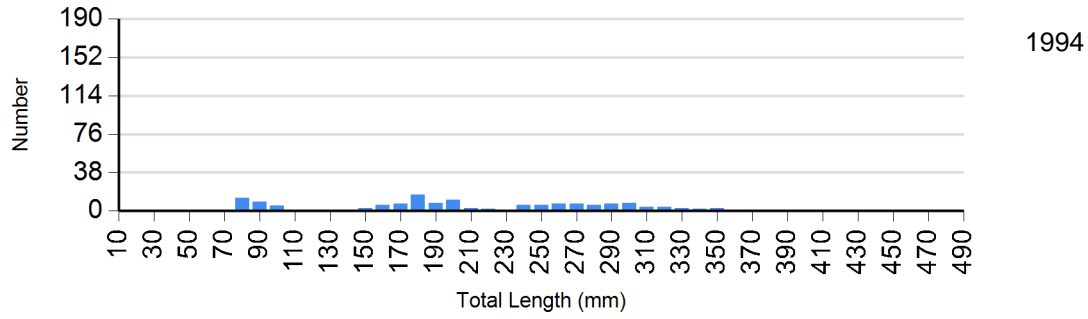
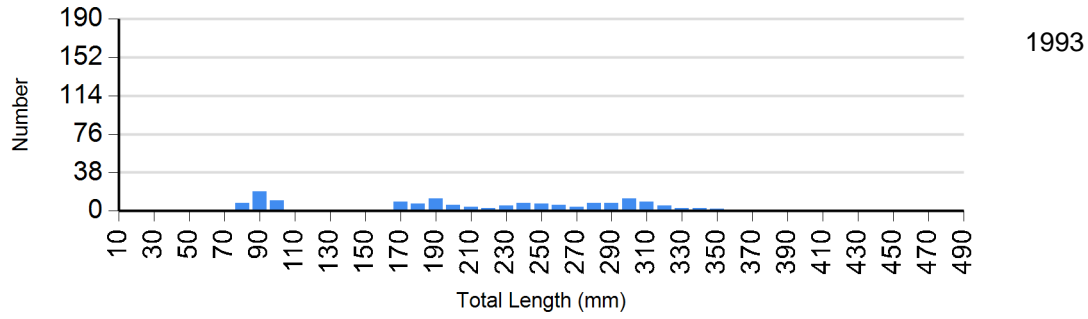


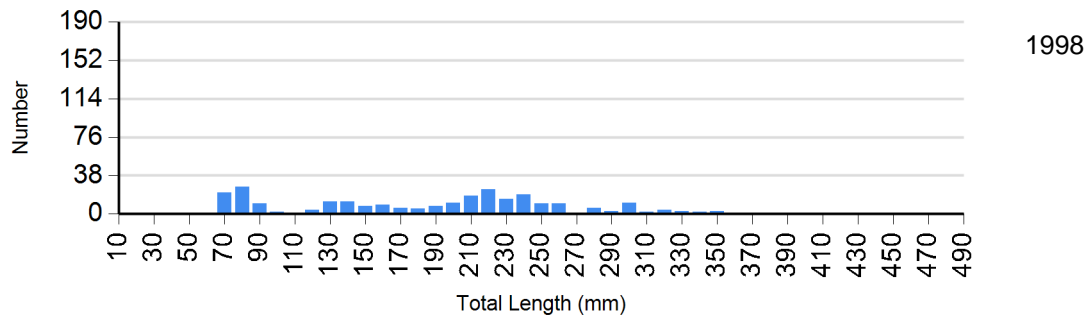
Site: 205  
Species: Brook Trout



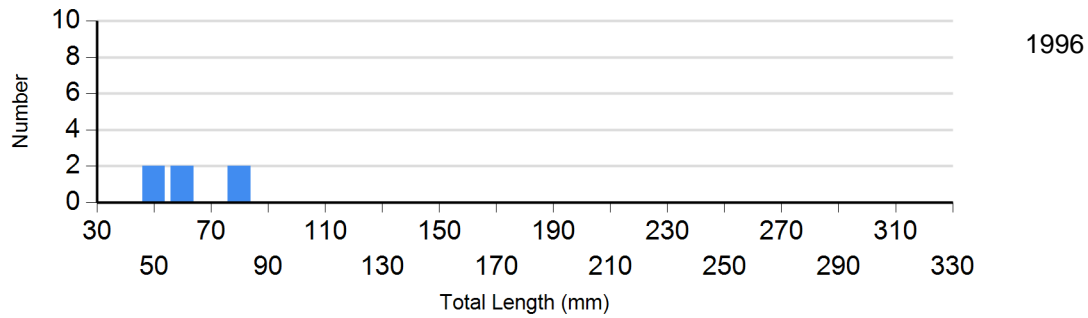
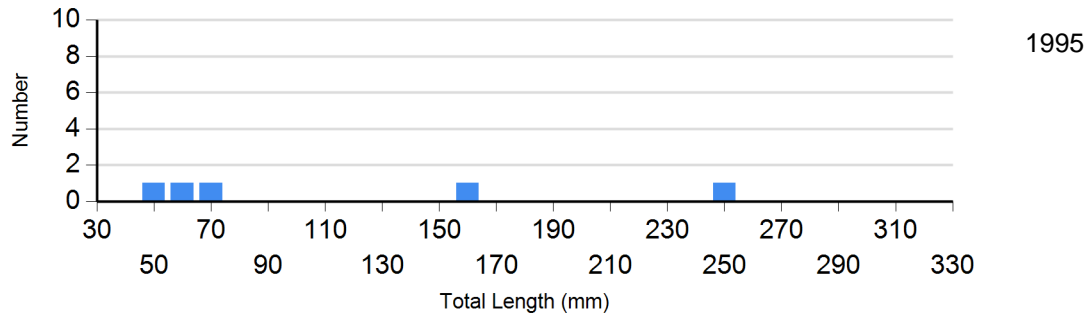


Site: 205  
Species: Brown Trout

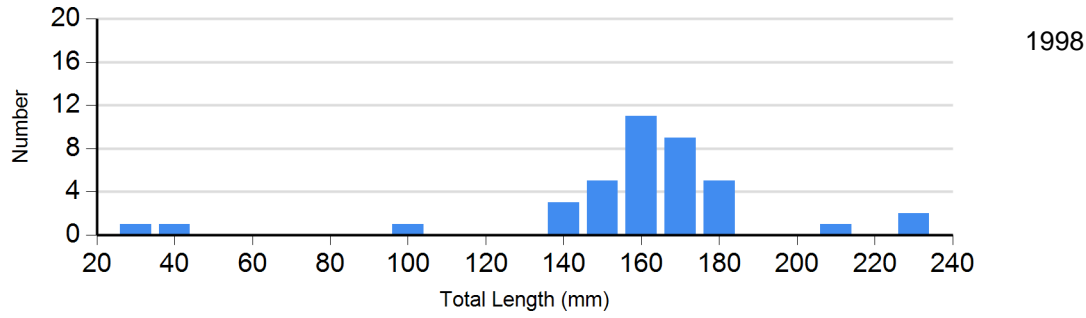




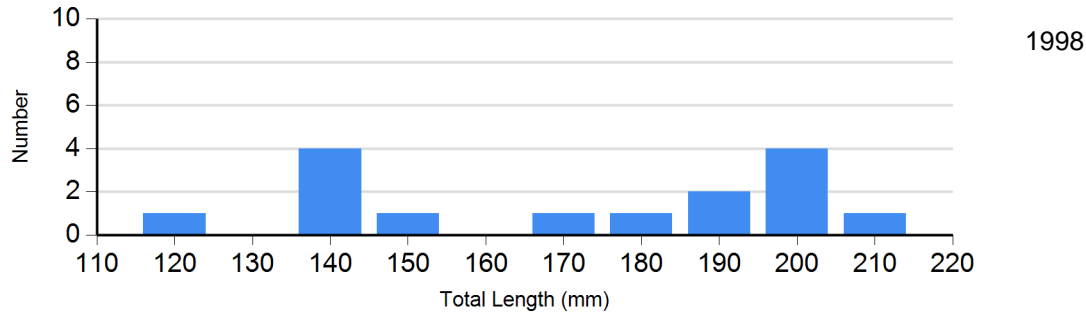
Site: 205  
Species: Rainbow Trout



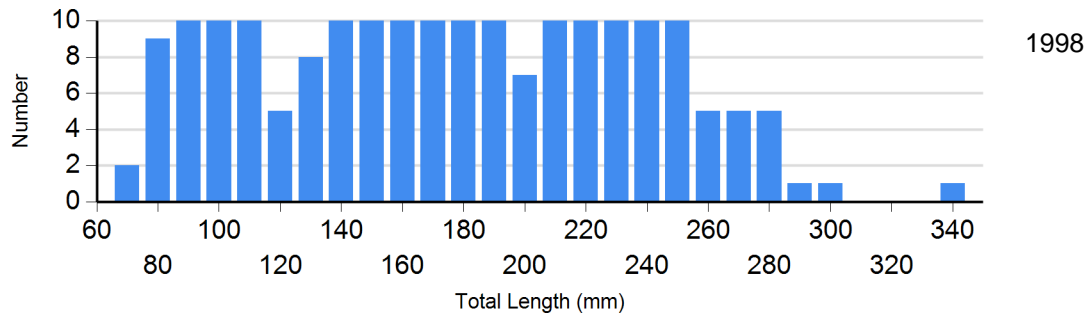
**Site: 267**  
**Species: Brown Trout**



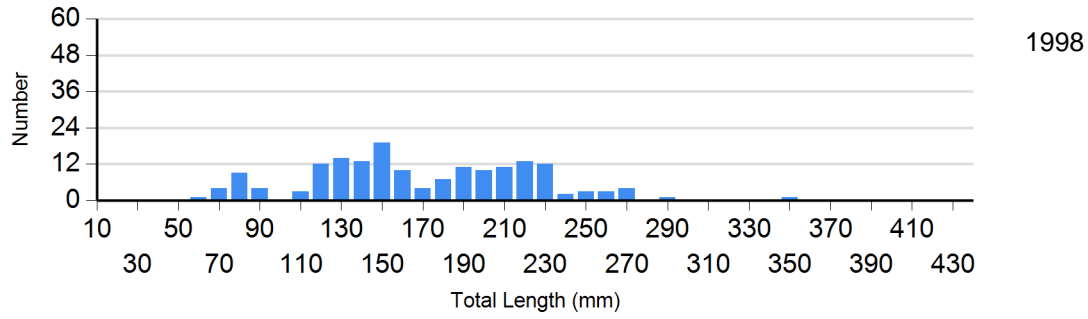
**Site: 302**  
**Species: Brook Trout**



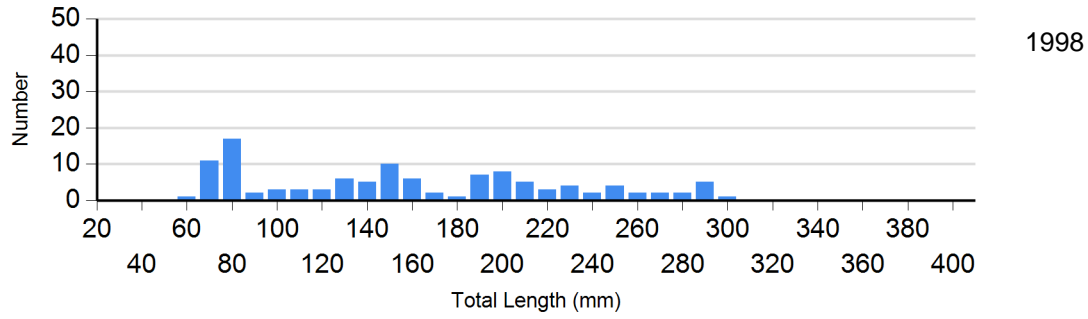
**Site: 302**  
**Species: Brown Trout**



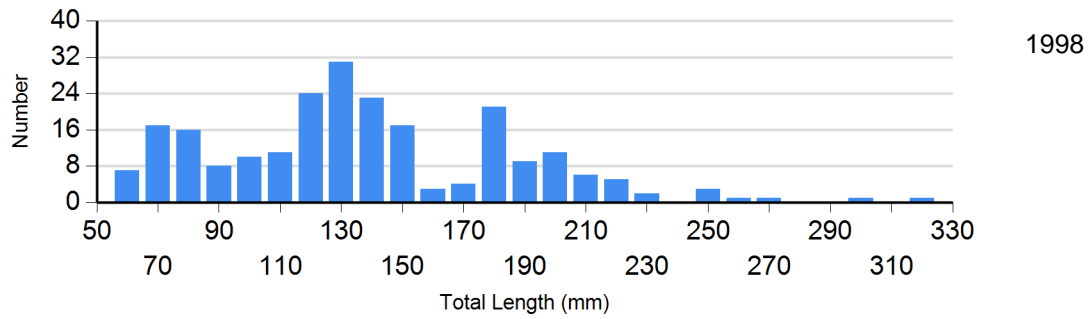
**Site: 418**  
**Species: Brown Trout**



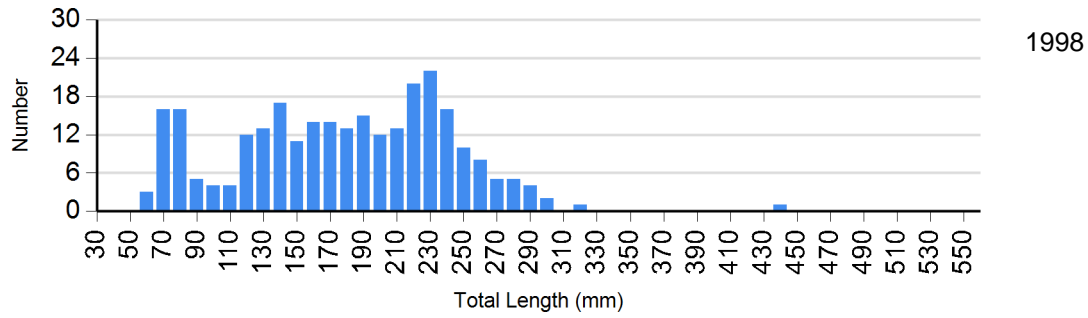
**Site: 477**  
**Species: Brown Trout**



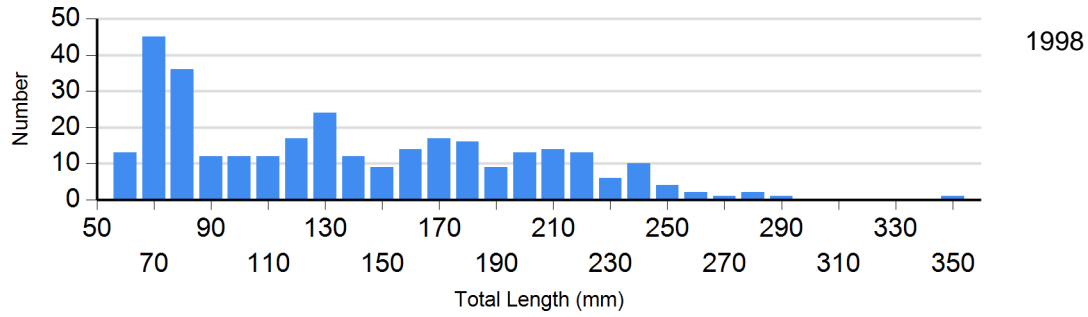
**Site: 494**  
**Species: Brown Trout**



**Site: 508**  
**Species: Brown Trout**



**Site: 524**  
**Species: Brown Trout**



**Site: 532**  
**Species: Brown Trout**

