

SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY
Castle Creek, Pennington County
02-0071-00
1998

Table 1. Population and Biomass Estimates for Castle Creek

Site Number: 356	Date Sampled: 09/29/1998	Conductivity (umhos/cm): 398
Site Midpoint (Latitude, Longitude): 44.05717425, -103.76307493	Site Length (m): 100	pH: 7.5
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 4.9	Water Temperature (C): 10.2
Stream Classification: BK2, BR1	Number of Pass: 3	Voltage: 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)
Brook Trout	<200mm	50	54	61	50	1111	32	540	450	28.63	869	134.9	28.9
Brook Trout	>=200mm	8	8	9	8	165	18	80	67	16.15	129	217.8	109.9
Brook Trout	All	58	62	69	58	1276	51	620	517	45.60	998	146.3	40.0
Brown Trout	<200mm	80	91	105	80	1872	66	910	758	58.83	1464	141.7	35.2
Brown Trout	>=200mm	40	40	41	40	823	145	400	333	129.76	644	253.8	176.6
Brown Trout	All	120	128	137	120	2634	217	1280	1067	193.58	2060	179.0	82.3

Site Number: 384	Date Sampled: 09/23/1998	Conductivity (umhos/cm): 394
Site Midpoint (Latitude, Longitude): 44.04396904, -103.77363060	Site Length (m): 119	pH: 8.3
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 4.7	Water Temperature (C): 12.8
Stream Classification: BK1, BR1	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	77	95	117	77	2039	68	798	826	60.97	1284	141.5	33.5
Brook Trout	>=200mm	34	38	46	34	815	109	319	330	97.26	514	229.7	133.6
Brook Trout	All	111	134	158	111	2876	184	1126	1165	164.71	1812	168.5	64.2

Brown Trout	<200mm	29	41	67	29	880	43	345	356	38.71	554	157.8	49.3
Brown Trout	>=200mm	40	40	41	40	858	235	336	348	209.38	541	285.8	273.2
Brown Trout	All	69	73	80	69	1567	281	613	634	250.49	987	232.0	179.1

Site Number: 388
Site Midpoint (Latitude, Longitude): 44.04338453, -103.77130517
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK1, BR1

Date Sampled: 09/23/1998
Site Length (m): 100
Mean Width (m): 4.3
Number of Pass: 3
Conductivity (umhos/cm): 395
pH: 8.3
Water Temperature (C): 13.3
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	61	88	128	61	2037	73	880	825	65.57	1416	139.7	36.0
Brook Trout	>=200mm	32	39	53	32	903	129	390	366	115.02	628	231.2	142.7
Brook Trout	All	93	129	171	93	2986	217	1290	1209	193.95	2076	171.2	72.7
Brown Trout	<200mm	20	21	25	20	486	34	210	197	30.30	338	184.3	69.8
Brown Trout	>=200mm	24	24	26	24	556	215	240	225	191.64	386	307.4	386.3
Brown Trout	All	44	47	53	44	1088	264	470	441	235.52	756	251.4	242.5

Site Number: 396
Site Midpoint (Latitude, Longitude): 44.04066846, -103.77461137
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK1, BR1

Date Sampled: 09/24/1998
Site Length (m): 125
Mean Width (m): 5.0
Number of Pass: 3
Conductivity (umhos/cm): 392
pH: 8.5
Water Temperature (C): 14.2
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)
Brook Trout	<200mm	104	153	209	104	3036	98	1224	1229	87.52	1969	136.0	32.3
Brook Trout	>=200mm	43	45	50	43	893	133	360	362	118.65	579	233.0	148.8
Brook Trout	All	148	190	227	153	3770	251	1520	1527	223.93	2446	164.3	66.5

Brown Trout	<200mm	28	39	63	28	774	53	312	313	47.34	502	167.3	68.5
Brown Trout	>=200mm	24	27	34	24	536	176	216	217	156.79	348	295.7	327.8
Brown Trout	All	52	67	90	52	1329	253	536	538	226.15	862	226.6	190.5

Site Number: 407

Site Midpoint (Latitude, Longitude): 44.03301361, -103.77614426

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BK1, BR1

Date Sampled: 09/24/1998

Site Length (m): 100

Mean Width (m): 4.1

Number of Pass: 3

Conductivity (umhos/cm): 399

pH: 8.3

Water Temperature (C): 12.9

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)
Brook Trout	<200mm	116	126	137	116	3073	73	1260	1245	64.86	2027	116.7	23.6
Brook Trout	>=200mm	40	40	42	40	976	172	400	395	154.01	644	245.6	176.8
Brook Trout	All	156	165	175	156	4024	253	1650	1630	226.05	2655	149.7	62.9
Brown Trout	<200mm	6	6	6	6	146	9	60	59	8.41	97	168.0	64.3
Brown Trout	>=200mm	18	18	19	18	439	185	180	178	165.20	290	325.6	421.4
Brown Trout	All	24	24	25	24	585	194	240	237	173.61	386	286.2	332.2

Site Number: 411

Site Midpoint (Latitude, Longitude): 44.03210666, -103.77970750

Survey Completed by: South Dakota Game, Fish and Parks

Stream Classification: BK1, BR3, RB2

Date Sampled: 09/22/1998

Site Length (m): 100

Mean Width (m): 6.1

Number of Pass: 3

Conductivity (umhos/cm): 397

pH:

Water Temperature (C): 12.9

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)
Brook Trout	<200mm	80	92	107	80	1498	66	920	607	59.22	1480	146.0	44.3
Brook Trout	>=200mm	58	60	65	58	977	181	600	396	161.39	965	239.8	185.0
Brook Trout	All	138	151	164	138	2459	254	1510	996	227.05	2430	185.4	103.4

Brown Trout	<200mm	3	3	4	3	49	3	30	20	3.05	48	182.0	70.0
Brown Trout	>=200mm	3	3	3	3	49	12	30	20	11.11	48	277.3	254.7
Brown Trout	All	6	6	6	6	98	16	60	40	14.16	97	229.7	162.3
Rainbow Trout	>=200mm	1	1	2	1	16	3	10	7	2.79	16	249.0	192.0
Rainbow Trout	All	1	1	2	1	16	3	10	7	2.79	16	249.0	192.0

Site Number: 417
Site Midpoint (Latitude, Longitude): 44.03016917, -103.78286708
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK1, BR2

Date Sampled: 09/22/1998
Site Length (m): 114
Mean Width (m): 6.5
Number of Pass: 3
Conductivity (umhos/cm): 400
pH:
Water Temperature (C): 12.5
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)
Brook Trout	<200mm	90	142	209	90	2191	122	1246	888	108.90	2004	169.2	55.7
Brook Trout	>=200mm	130	150	169	131	2315	460	1316	938	410.36	2117	252.9	198.5
Brook Trout	All	221	281	324	238	4336	606	2465	1756	541.05	3966	218.7	139.7
Brown Trout	<200mm	1	1	1	1	15	1	9	6	0.91	14	183.0	66.0
Brown Trout	>=200mm	4	4	6	4	62	17	35	25	15.42	56	285.3	279.8
Brown Trout	All	5	5	7	5	77	18	44	31	16.33	71	264.8	237.0
White Sucker	All	7	7	9	7	108	21	61	44	18.66	99	249.4	193.4

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	
Class BR1	Number of wild Brown Trout exceeds 150 per acre
Class BR2	Number of wild Brook Trout ranges from 25 to 150 per acre
Class BR3	Number of wild Brown Trout is less than 25 per acre
Class BK1	Number of wild Brook Trout exceeds 150 per acre
Class BK2	Number of wild Brook Trout ranges from 25 to 150 per acre
Class BK3	Number of wild Brook Trout is less than 25 per acre
Class RB1	Number of wild Rainbow Trout exceeds 25 per acre
Class RB2	Number of wild Rainbow Trout is less than 25 per acre

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

Site 356

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 16, 1992	71	71-72	
	Oct 13, 1993	80	71-92	
	Nov 08, 1994	167	165-171	
	Sep 06, 1995	50	50-52	
	Sep 24, 1996	71	72-83	
	Sep 12, 1997	77	65-93	
	Sep 29, 1998	54	50-61	

Brook Trout >=200mm	Oct 16, 1992	3	3-3	BK2
	Oct 13, 1993	5	5-5	BK2
	Nov 08, 1994	7	7-7	BK2
	Sep 06, 1995	7	7-8	BK2
	Sep 24, 1996	8	8-10	BK2
	Sep 12, 1997	23	11-82	BK1
	Sep 29, 1998	8	8-9	BK2
Brown Trout <200mm	Oct 16, 1992	86	84-90	
	Oct 13, 1993	58	57-61	
	Nov 08, 1994	59	59-61	
	Sep 06, 1995	21	21-22	
	Sep 24, 1996	18	14-30	
	Sep 12, 1997	123	109-138	
	Sep 29, 1998	91	80-105	
Brown Trout >=200mm	Oct 16, 1992	23	23-24	BR1
	Oct 13, 1993	25	25-25	BR1

Brown Trout >=200mm	Nov 08, 1994	24	24-24	BR1
	Sep 06, 1995	30	30-30	BR1
	Sep 24, 1996	17	17-19	BR1
	Sep 12, 1997	14	13-19	BR2
	Sep 29, 1998	40	40-41	BR1

Site 384

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 14, 1992	127	109-146	
	Oct 12, 1993	87	84-92	
	Nov 07, 1994	81	81-83	
	Sep 05, 1995	60	59-63	
	Sep 16, 1996	30	30-32	
	Sep 12, 1997	65	49-90	
	Sep 23, 1998	95	77-117	
Brook Trout >=200mm	Oct 14, 1992	11	11-12	BK2
	Oct 12, 1993	21	21-21	BK1

Brook Trout >=200mm	Nov 07, 1994	12	12-13	BK2
	Sep 05, 1995	30	30-31	BK1
	Sep 16, 1996	25	25-27	BK1
	Sep 12, 1997	24	23-28	BK1
	Sep 23, 1998	38	34-46	BK1
Brown Trout <200mm	Oct 14, 1992	13	13-14	
	Oct 12, 1993	38	37-41	
	Nov 07, 1994	10	10-10	
	Sep 05, 1995	6	6-8	
	Sep 16, 1996	4	4-5	
	Sep 12, 1997	28	13-95	
	Sep 23, 1998	41	29-67	
Brown Trout >=200mm	Oct 14, 1992	34	32-39	BR1
	Oct 12, 1993	29	29-30	BR1
	Nov 07, 1994	47	43-55	BR1
	Sep 05, 1995	43	43-45	BR1

Brown Trout >=200mm	Sep 16, 1996	32	29-39	BR1
	Sep 12, 1997	33	27-46	BR1
	Sep 23, 1998	40	40-41	BR1
White Sucker	Oct 14, 1992	7	7-9	
	Nov 07, 1994	1	1-2	

Site 388

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 14, 1992	26	26-27	
	Oct 12, 1993	58	53-66	
	Nov 07, 1994	67	67-68	
	Sep 05, 1995	69	63-78	
	Sep 16, 1996	41	34-54	
	Sep 16, 1997	32	32-34	
	Sep 23, 1998	88	61-128	
Brook Trout >=200mm	Oct 14, 1992	16	12-30	BK2
	Oct 12, 1993	14	14-15	BK2

Brook Trout >=200mm	Nov 07, 1994	34	34-35	BK1
	Sep 05, 1995	35	35-36	BK1
	Sep 16, 1996	12	12-12	BK2
	Sep 16, 1997	16	14-23	BK2
	Sep 23, 1998	39	32-53	BK1
Brown Trout <200mm	Oct 14, 1992	10	10-10	
	Oct 12, 1993	17	17-19	
	Nov 07, 1994	10	10-10	
	Sep 05, 1995	2	2-2	
	Sep 16, 1997	3	4-5	
	Sep 23, 1998	21	20-25	
Brown Trout >=200mm	Oct 14, 1992	27	27-28	BR1
	Oct 12, 1993	33	33-35	BR1
	Nov 07, 1994	31	31-32	BR1
	Sep 05, 1995	26	25-30	BR1
	Sep 16, 1996	22	21-26	BR1

Brown Trout >=200mm	Sep 16, 1997	2	2-6	BR3
	Sep 23, 1998	24	24-26	BR1
White Sucker	Nov 07, 1994	1	1-1	

Site 396

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 17, 1996	20	19-24	
	Sep 16, 1997	61	62-73	
	Sep 24, 1998	153	104-209	
Brook Trout >=200mm	Sep 17, 1996	31	31-32	BK1
	Sep 16, 1997	10	11-16	BK2
	Sep 24, 1998	45	43-50	BK1
Brown Trout <200mm	Sep 16, 1997	17	18-22	
	Sep 24, 1998	39	28-63	
Brown Trout >=200mm	Sep 17, 1996	20	20-20	BR1
	Sep 16, 1997	13	13-14	BR2
	Sep 24, 1998	27	24-34	BR1

Site 407

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 18, 1996	57	48-71	
	Sep 17, 1997	73	59-92	
	Sep 24, 1998	126	116-137	
Brook Trout >=200mm	Sep 18, 1996	23	23-25	BK1
	Sep 17, 1997	15	14-19	BK2
	Sep 24, 1998	40	40-42	BK1
Brown Trout <200mm	Sep 18, 1996	2	2-6	
	Sep 17, 1997	2	2-3	
	Sep 24, 1998	6	6-6	
Brown Trout >=200mm	Sep 18, 1996	21	21-23	BR1
	Sep 17, 1997	11	11-13	BR2
	Sep 24, 1998	18	18-19	BR1
White Sucker	Sep 18, 1996	1	1-1	

Site 411

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 06, 1995	59	50-73	
	Sep 18, 1996	57	53-64	
	Sep 17, 1997	130	58-287	
	Sep 22, 1998	92	80-107	
Brook Trout >=200mm	Sep 06, 1995	10	10-10	BK2
	Sep 18, 1996	14	14-14	BK2
	Sep 17, 1997	19	17-25	BK2
	Sep 22, 1998	60	58-65	BK1
Brown Trout <200mm	Sep 06, 1995	3	3-3	
	Sep 18, 1996	1	1-1	
	Sep 17, 1997	1	1-2	
	Sep 22, 1998	3	3-4	
Brown Trout >=200mm	Sep 18, 1996	6	6-7	BR2
	Sep 17, 1997	1	1-1	BR3
	Sep 22, 1998	3	3-3	BR3

Rainbow Trout >=200mm

Sep 22, 1998

1

1-2

RB2

Site 417

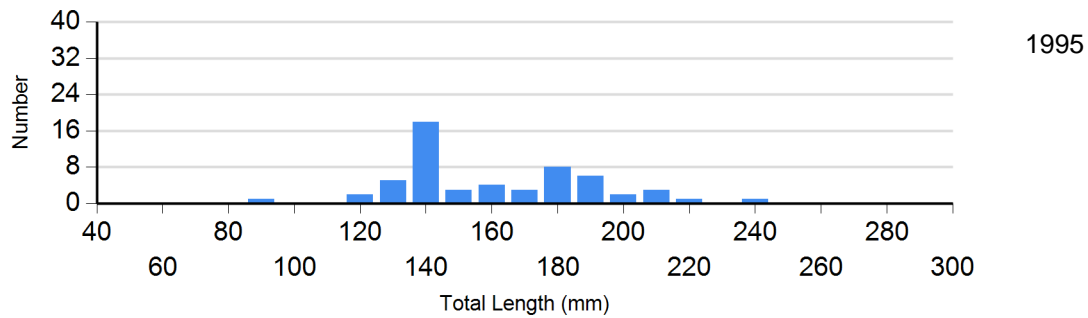
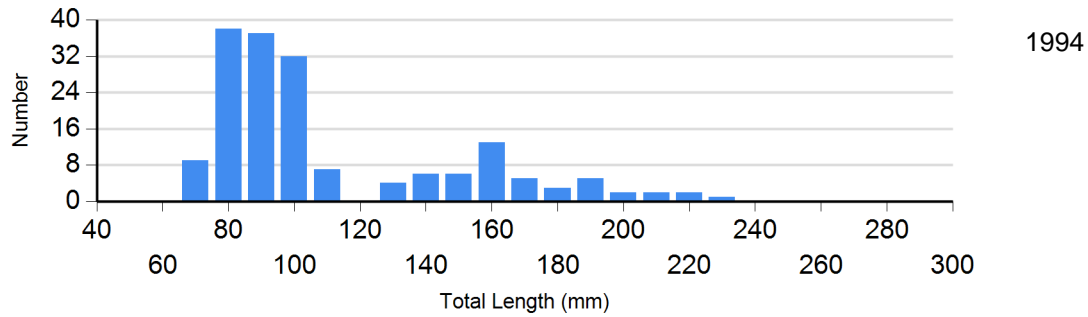
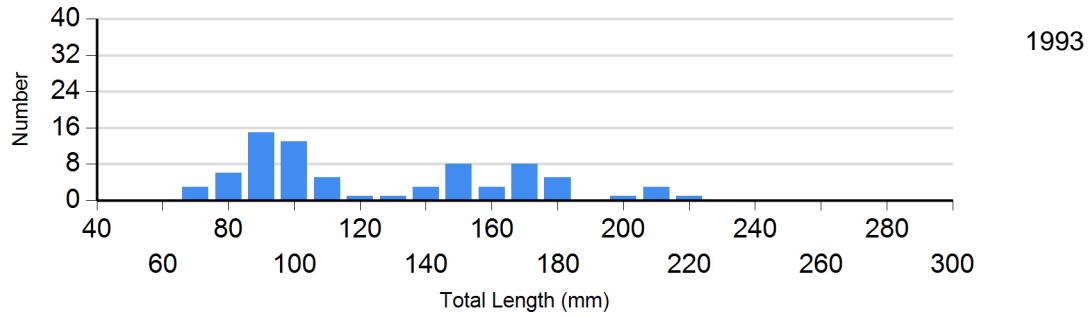
Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 24, 1996	31	31-32	
	Sep 18, 1997	35	27-52	
	Sep 22, 1998	142	90-209	
Brook Trout >=200mm	Sep 24, 1996	104	104-106	BK1
	Sep 18, 1997	112	96-130	BK1
	Sep 22, 1998	150	131-169	BK1
Brown Trout <200mm	Sep 22, 1998	1	1-1	
Brown Trout >=200mm	Sep 24, 1996	8	8-8	BR2
	Sep 18, 1997	8	8-10	BR2
	Sep 22, 1998	4	4-6	BR2
White Sucker	Sep 24, 1996	9	9-10	
	Sep 18, 1997	4	4-4	
	Sep 22, 1998	7	7-9	

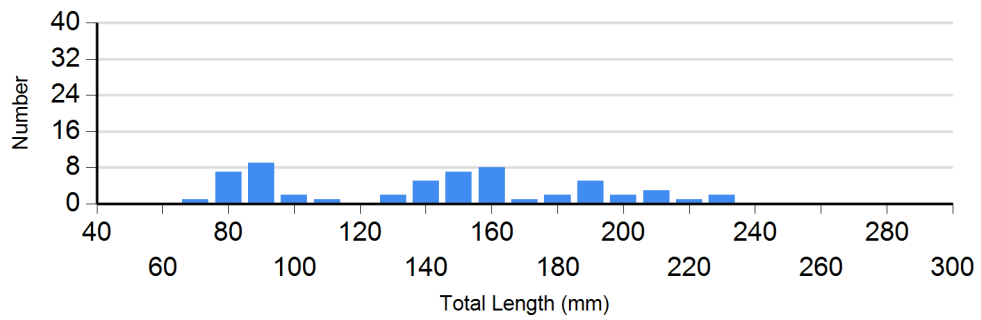
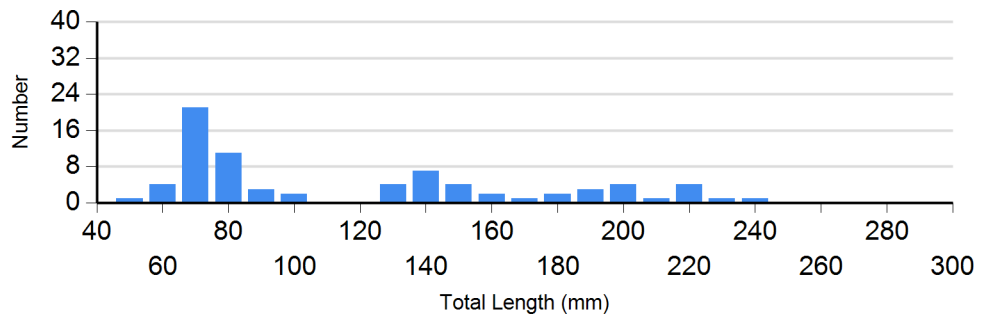
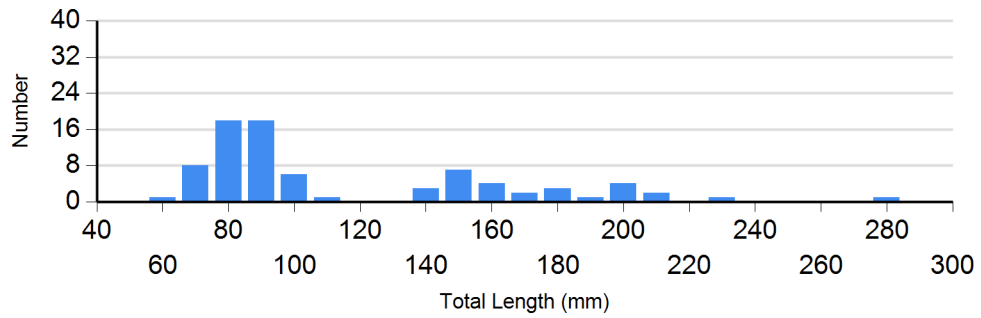
Length Frequency Distribution

Length frequency histogram of species sampled by year.

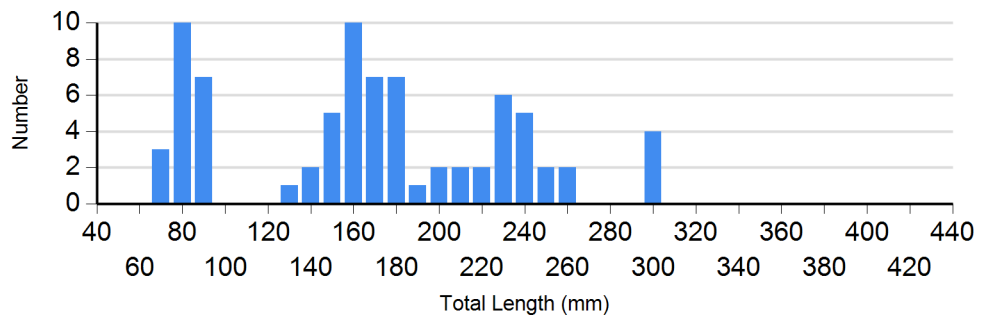
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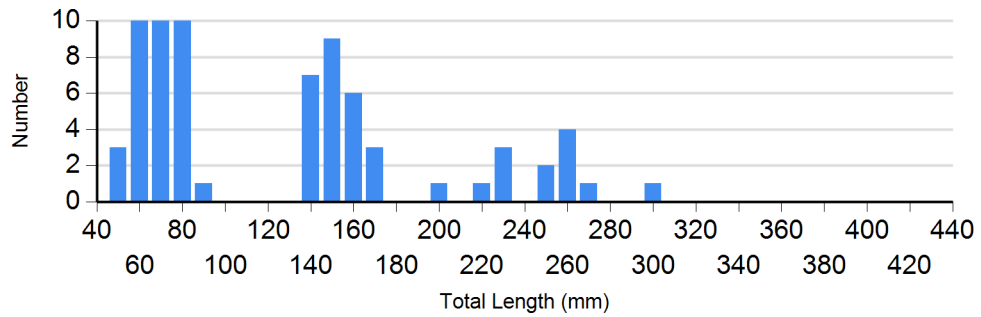
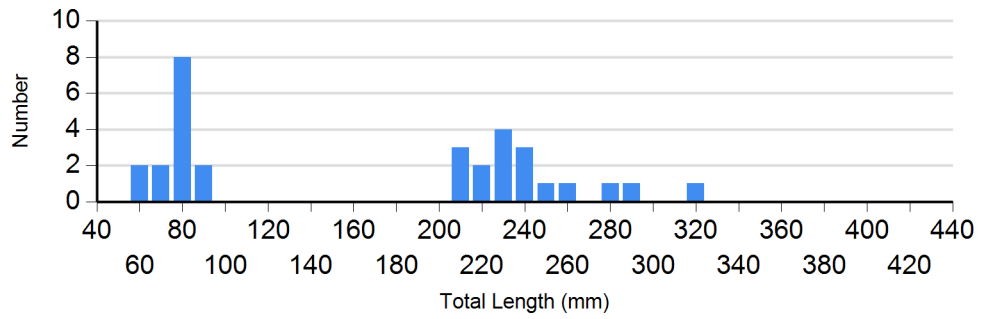
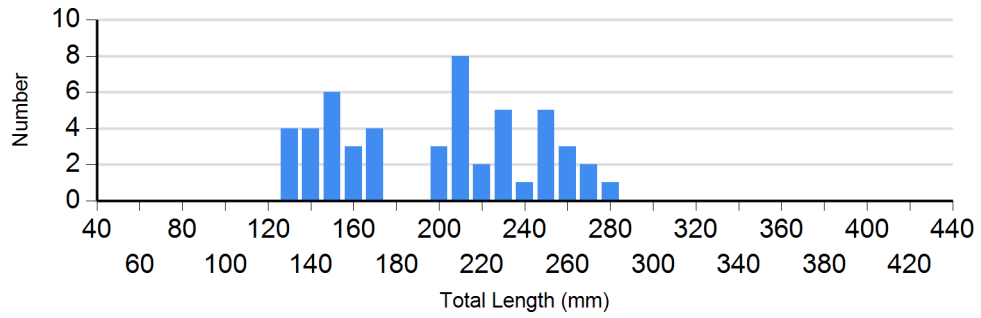
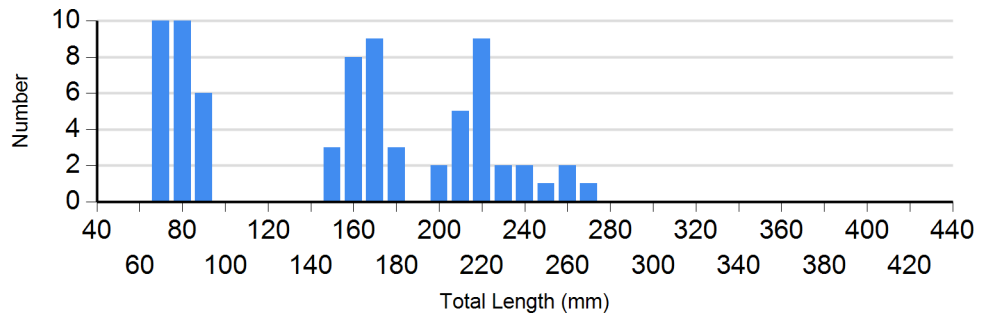
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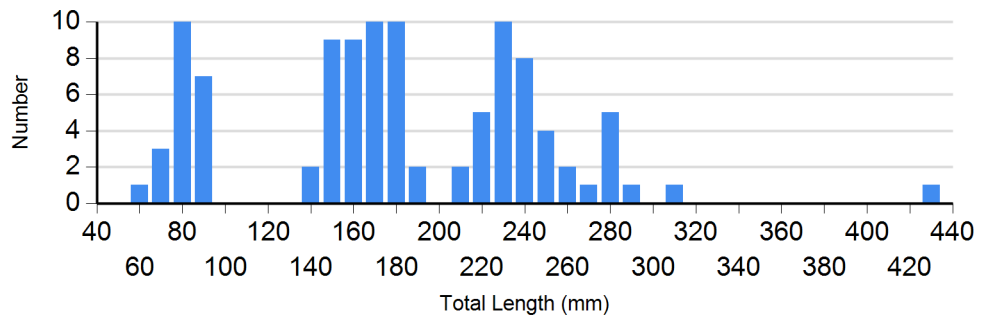




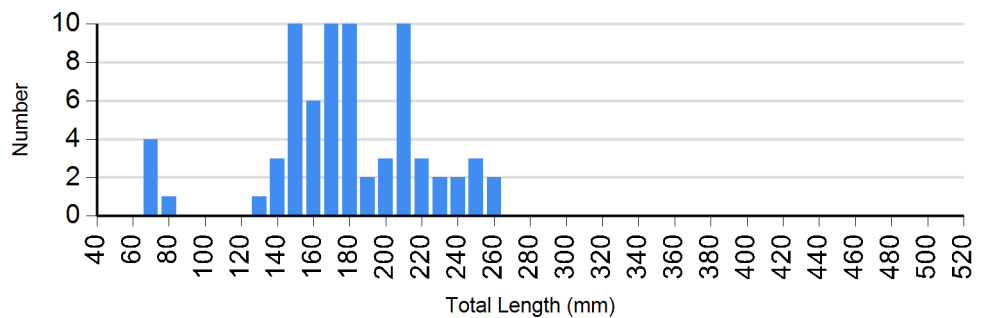
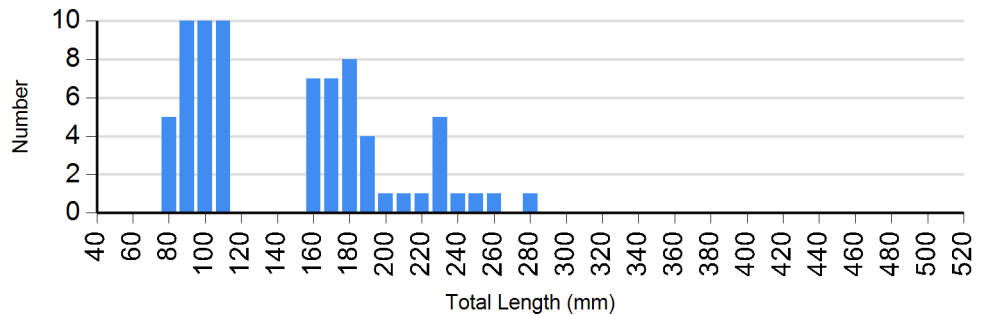
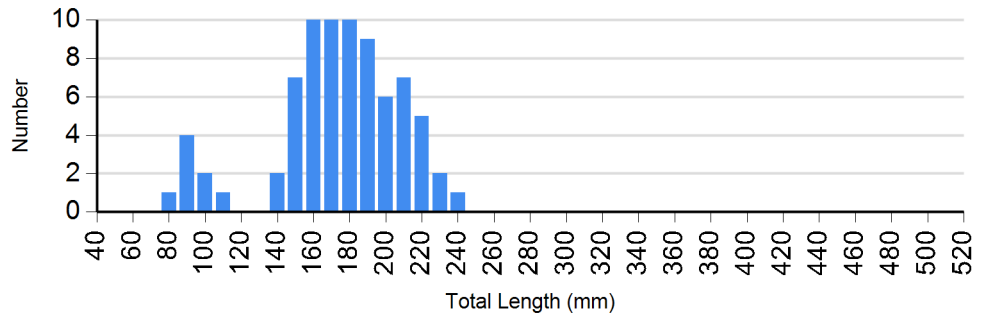
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Species: Brown Trout

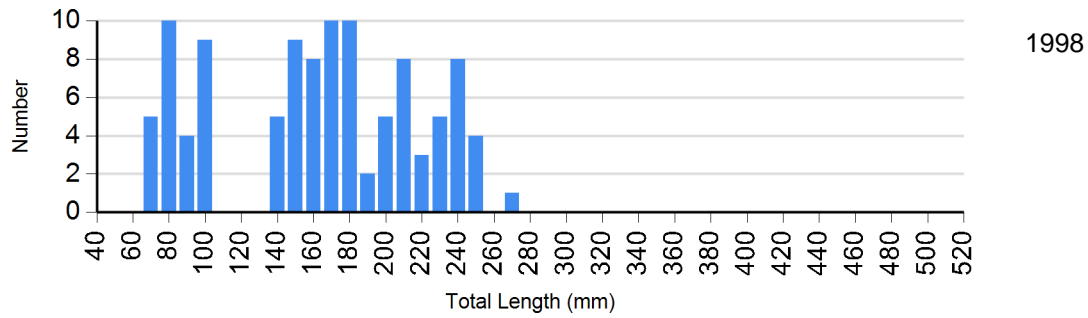
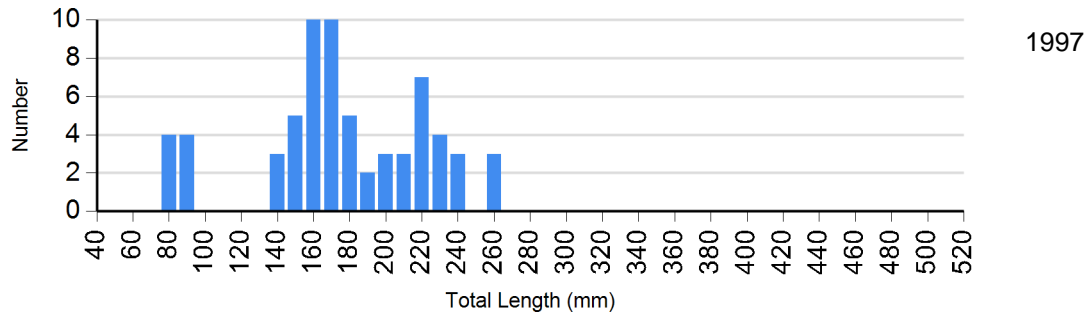
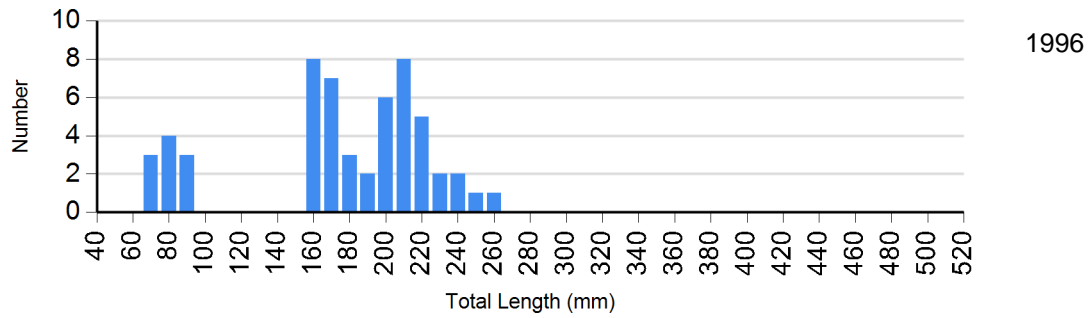




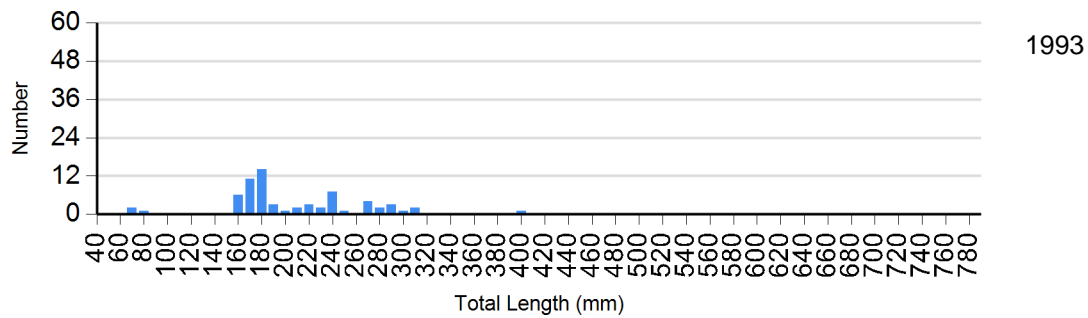


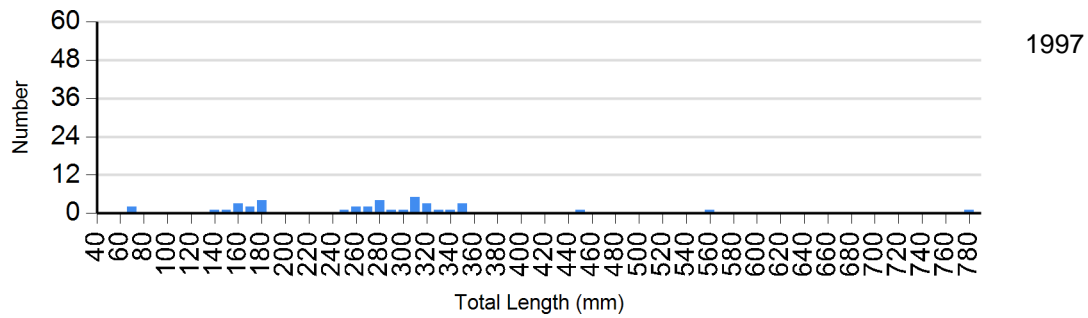
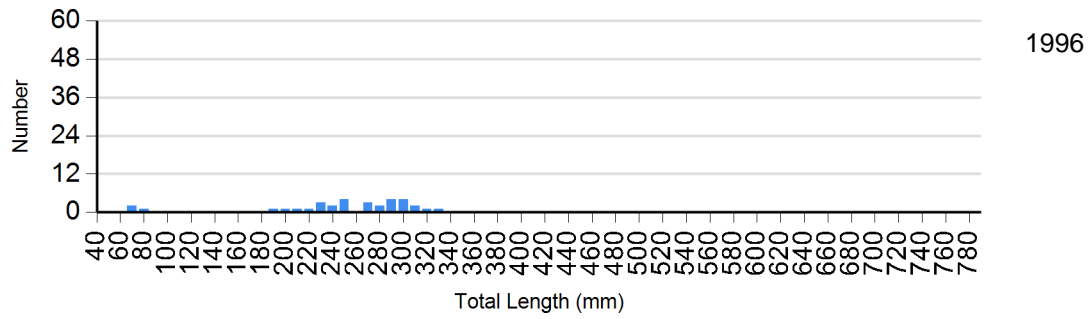
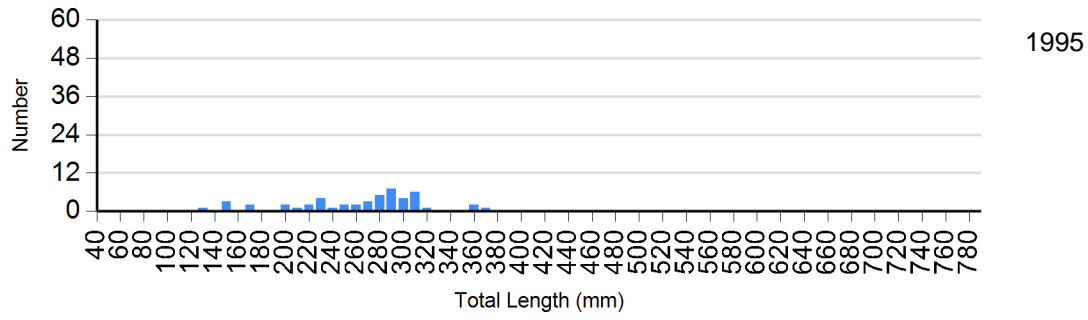
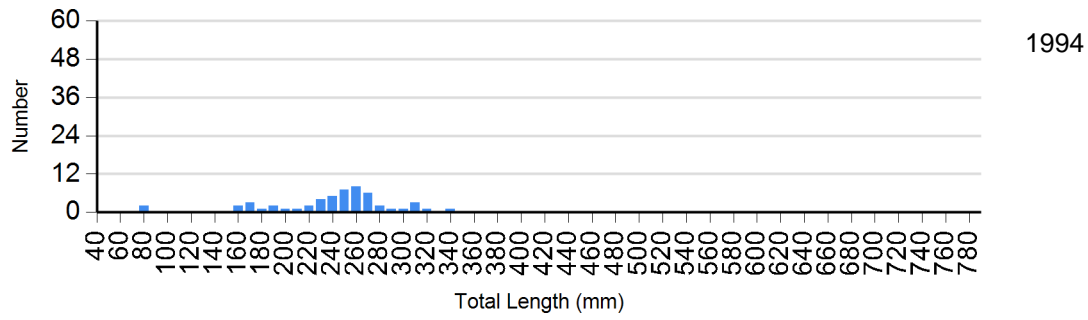
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Species: Brook Trout

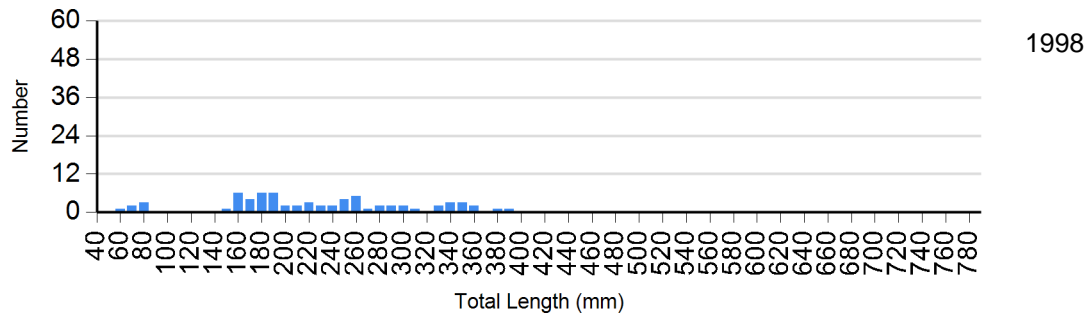




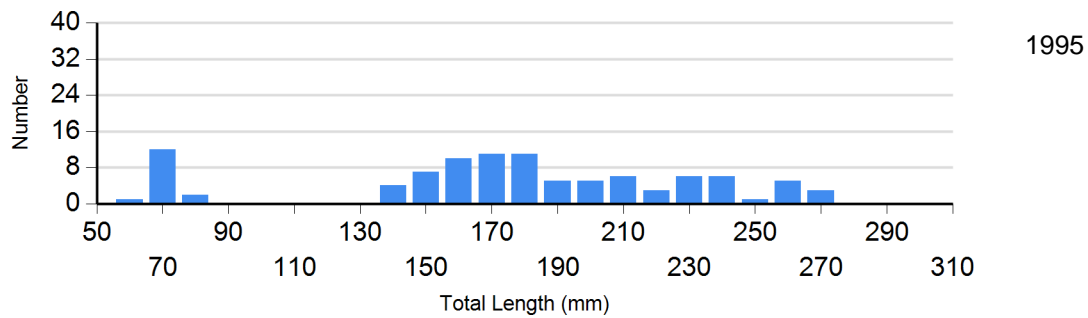
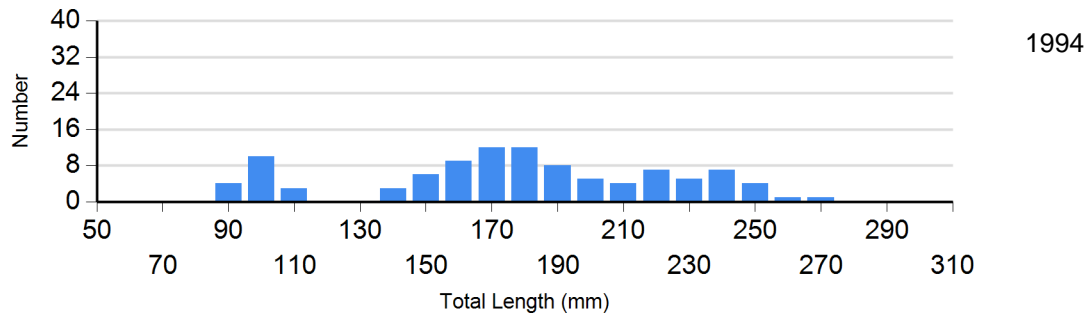
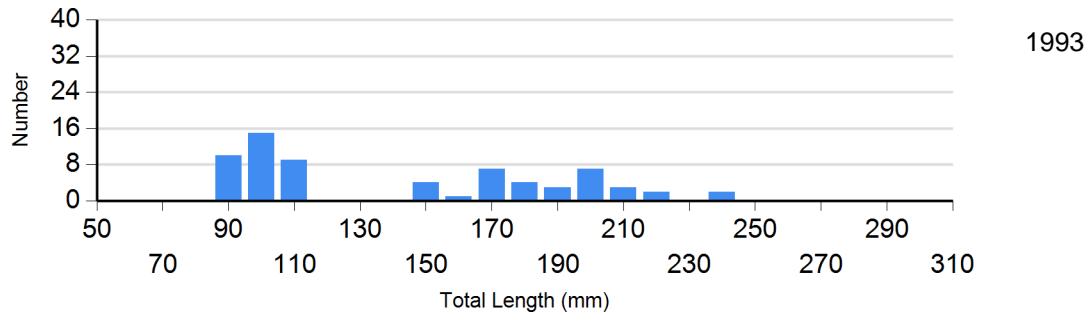
Site: 384
Species: Brown Trout

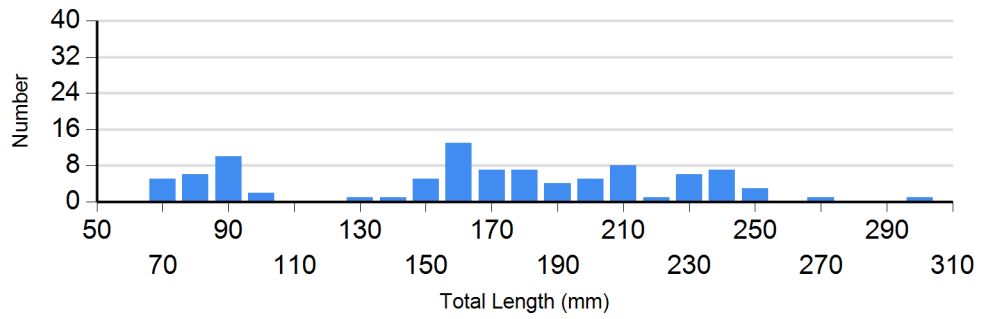
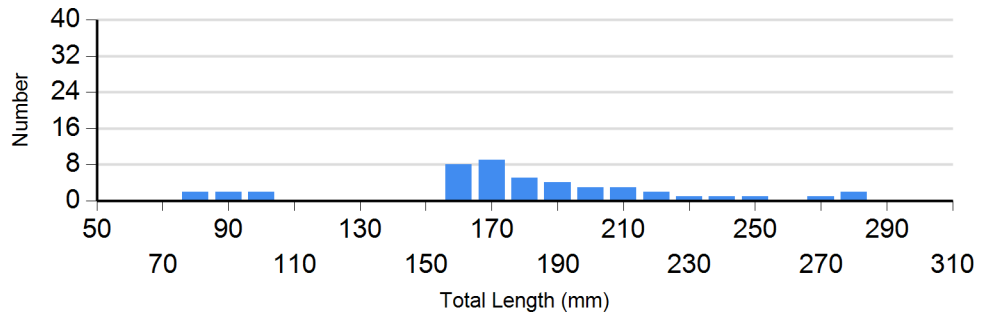
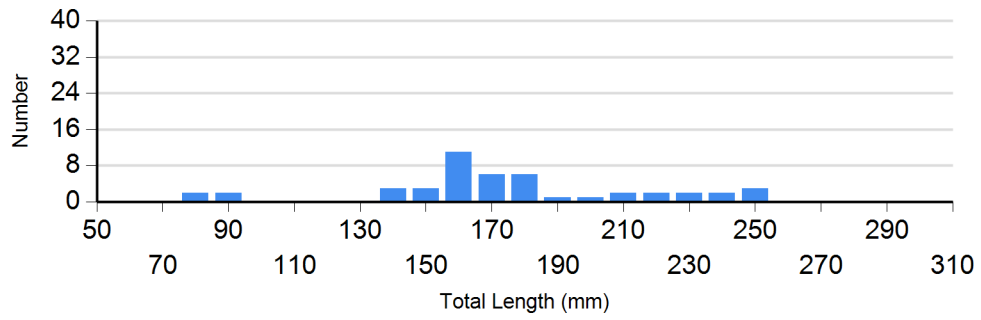




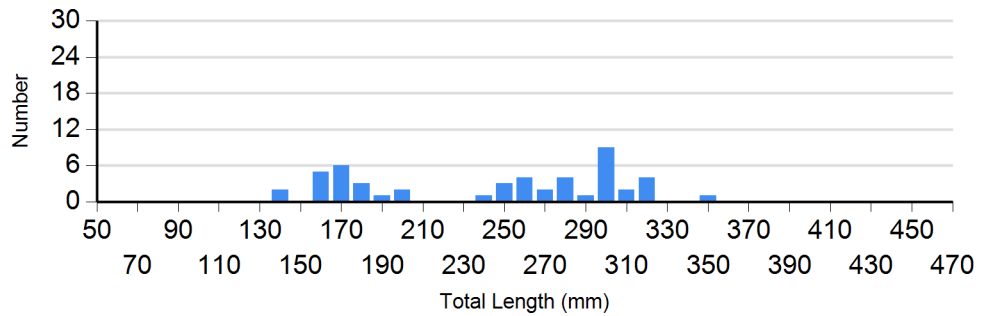


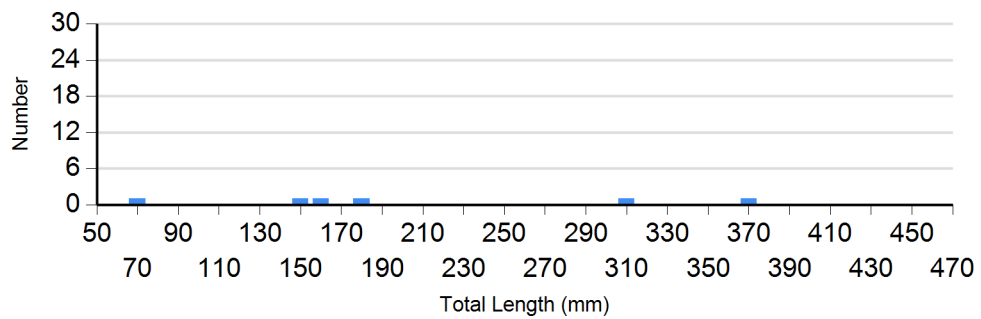
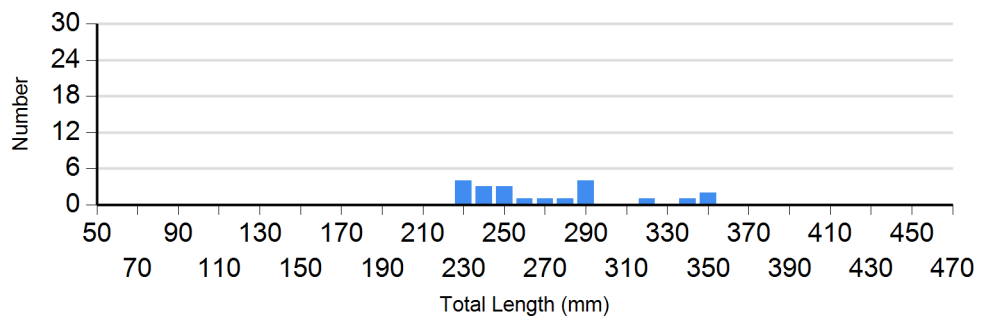
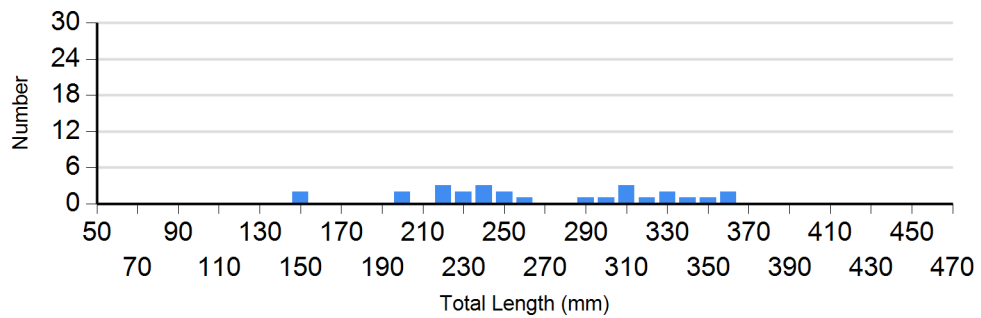
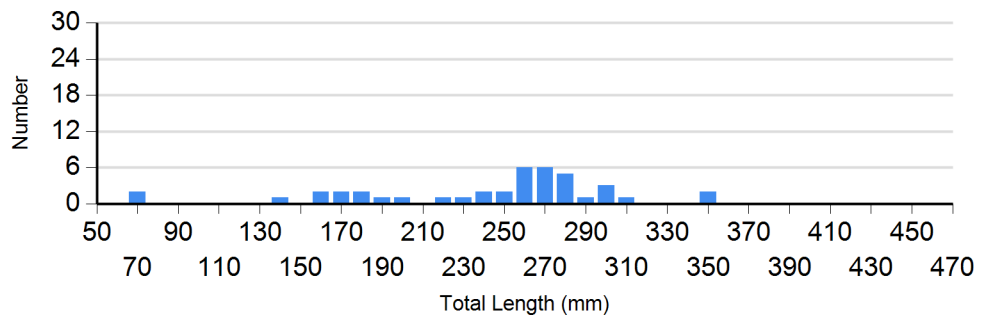
Site: 388
Species: Brook Trout

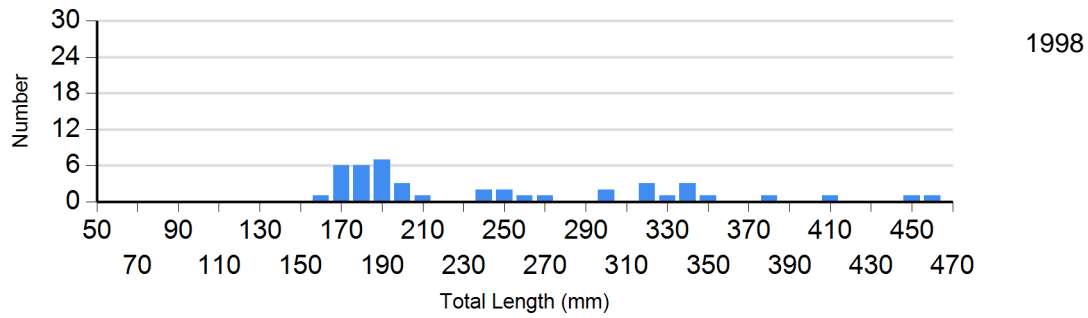




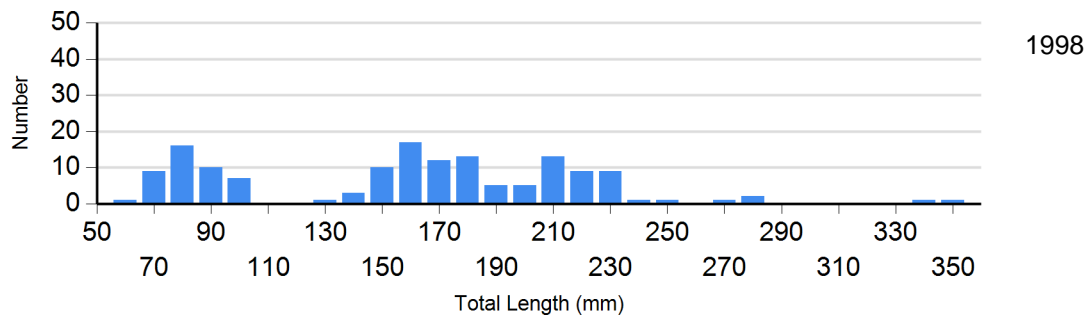
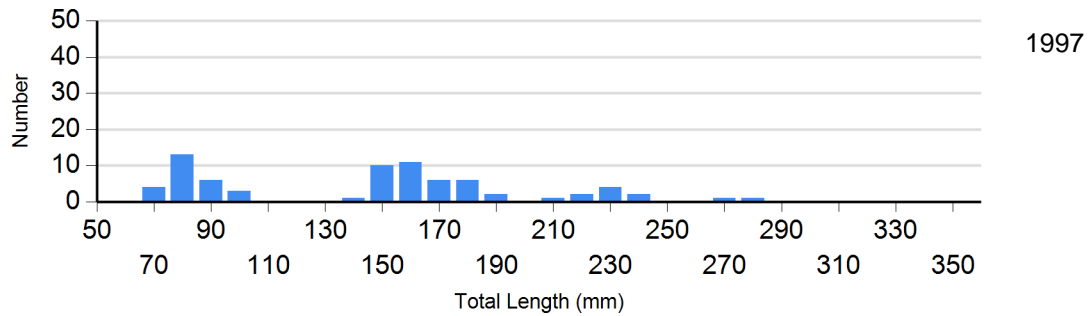
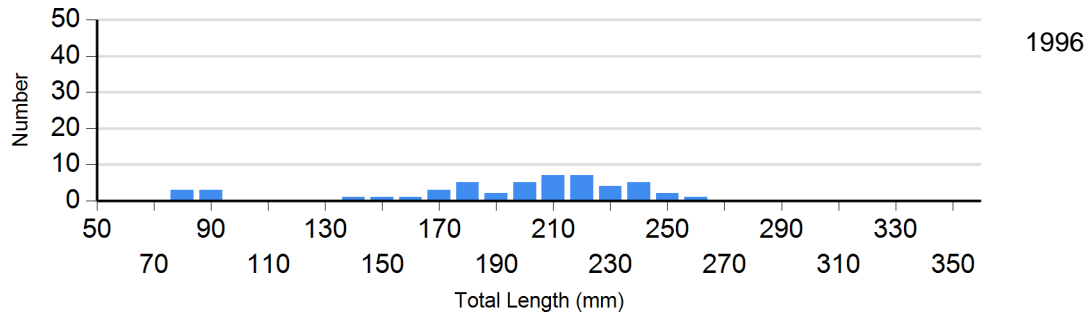
Site: 388
Species: Brown Trout



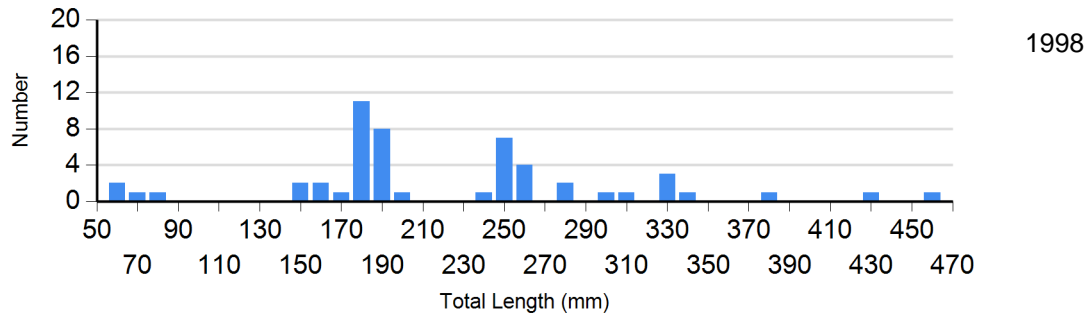
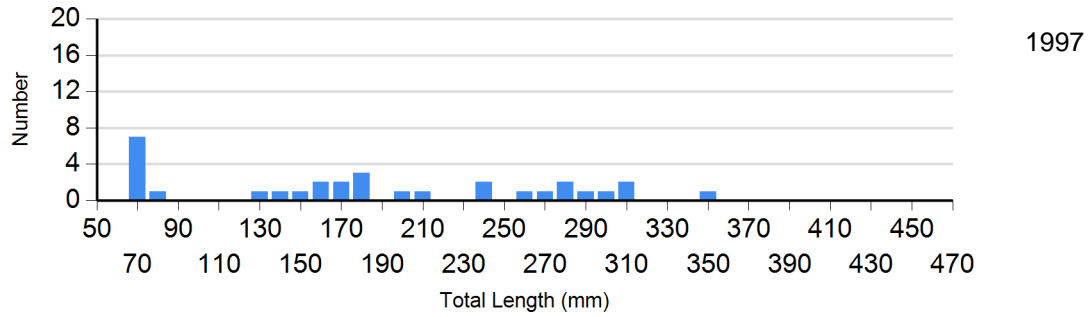
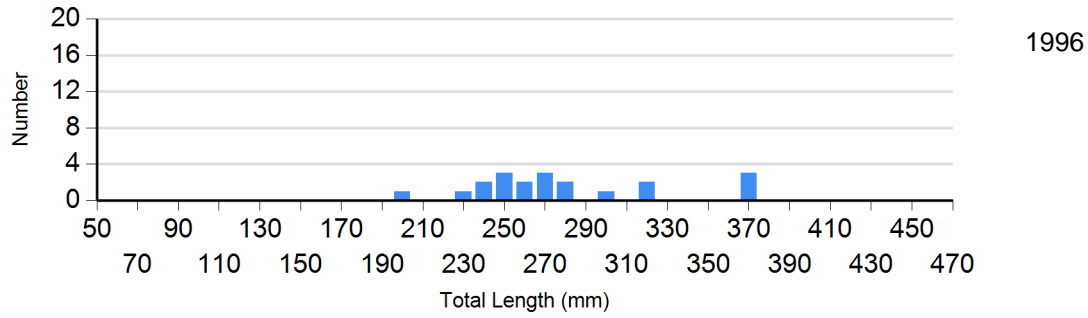




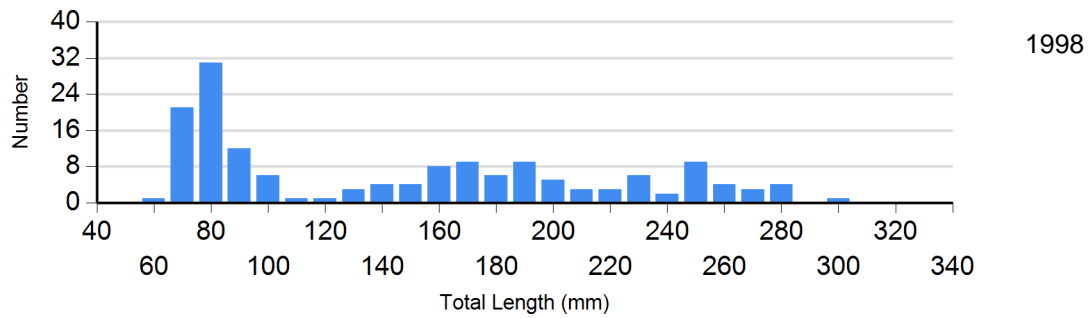
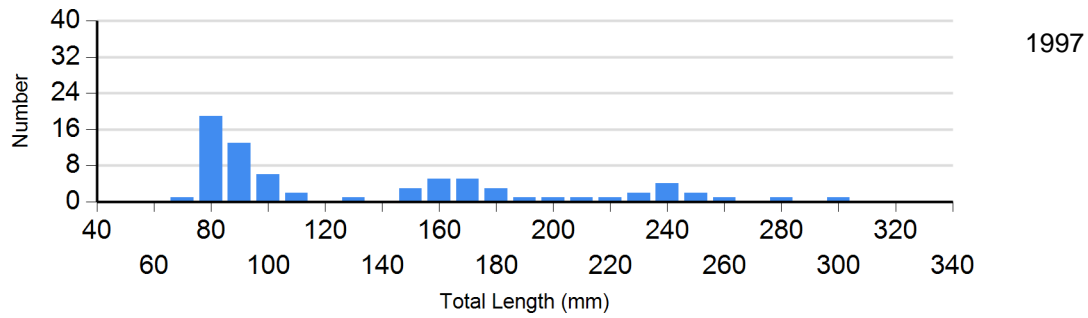
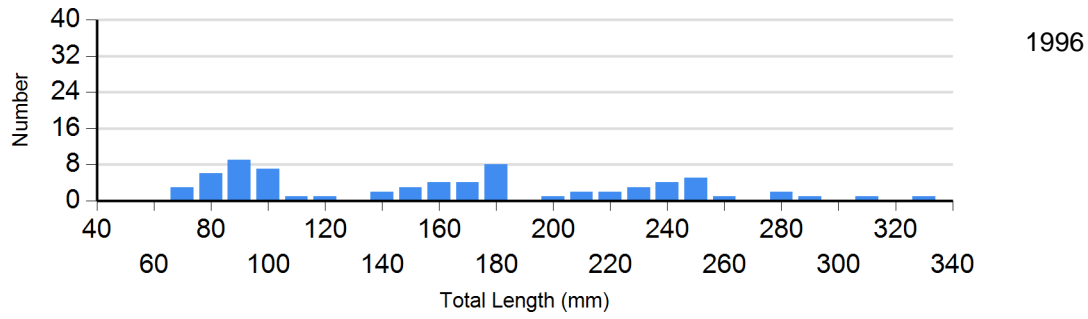
Site: 396
Species: Brook Trout



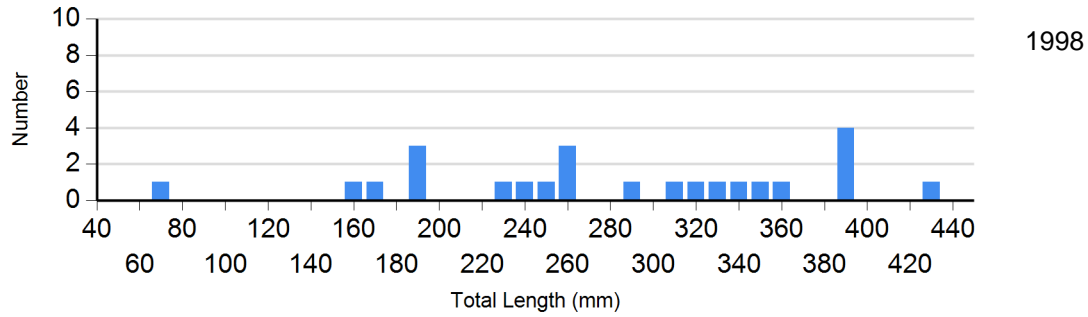
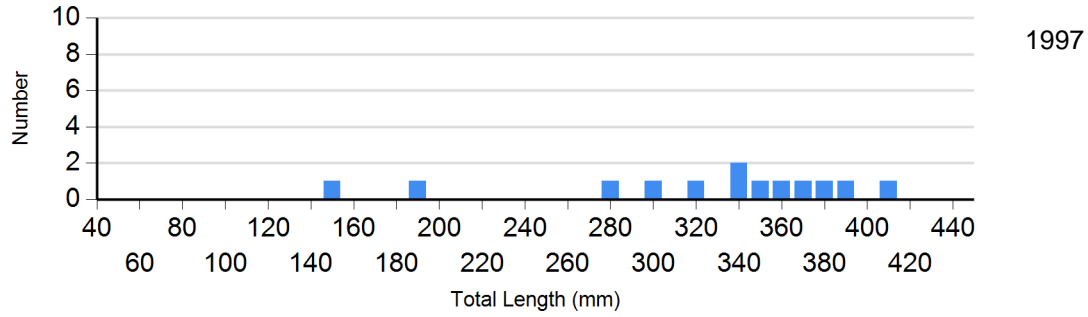
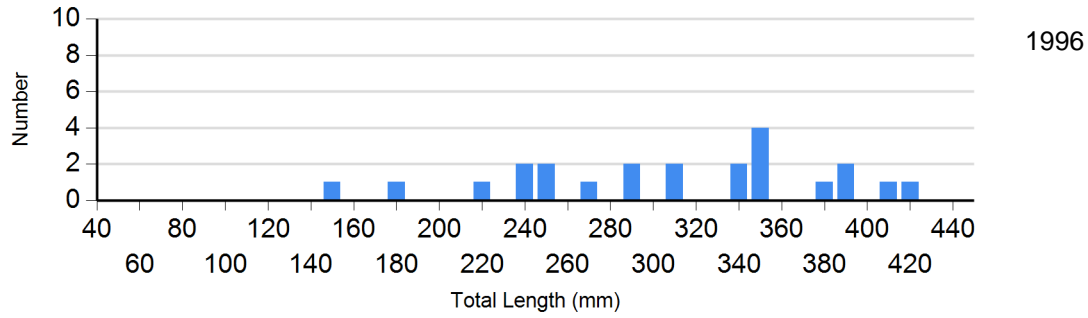
Site: 396
Species: Brown Trout



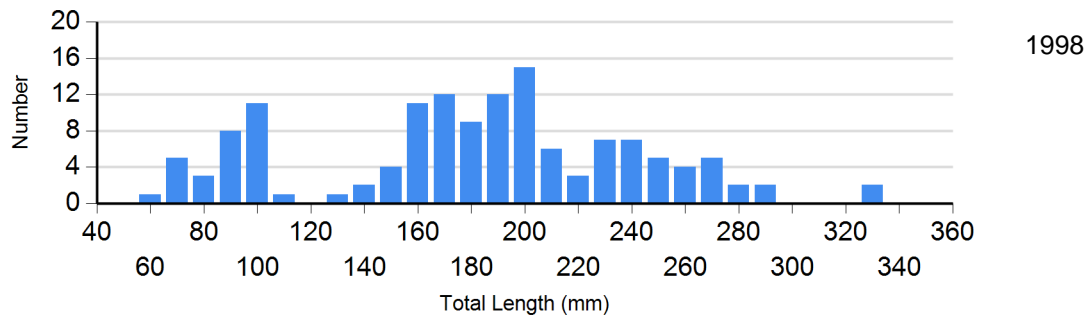
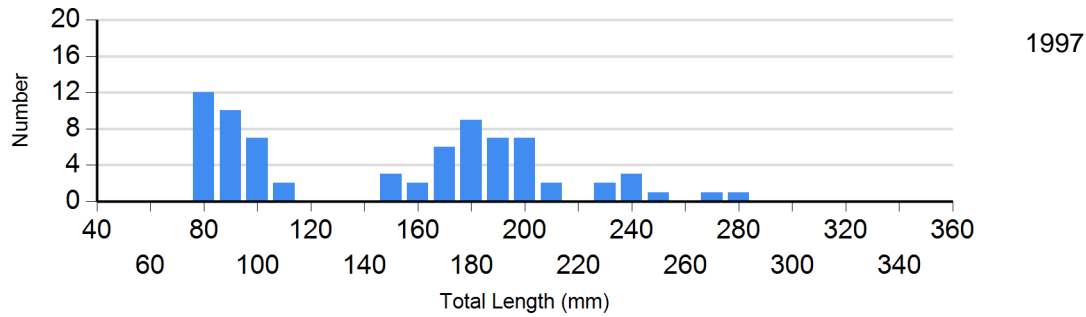
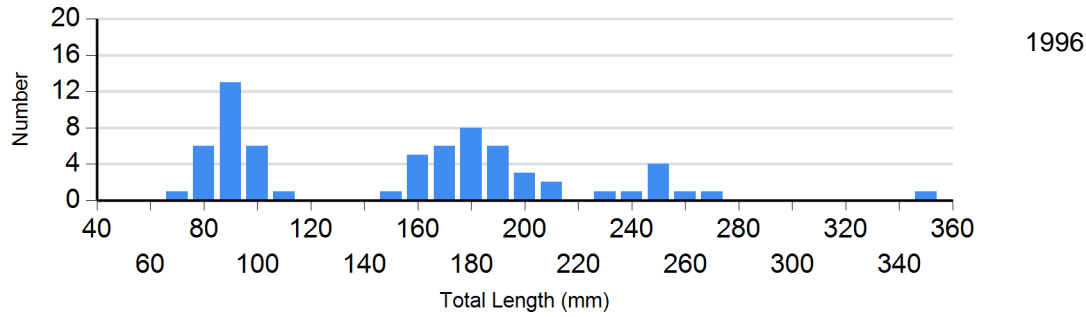
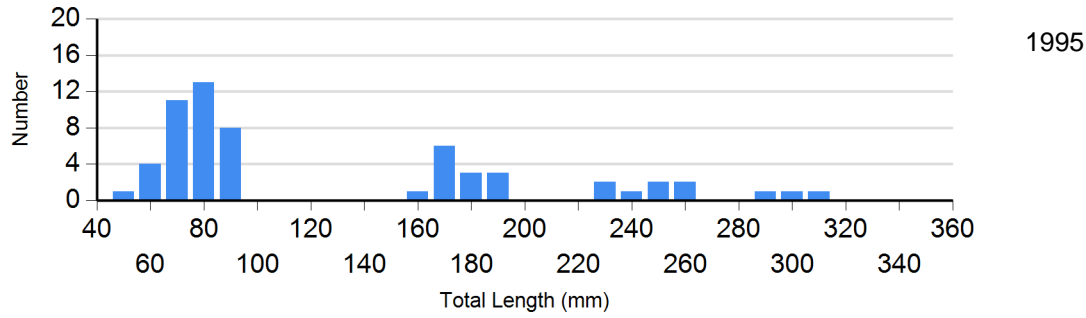
Site: 407
Species: Brook Trout



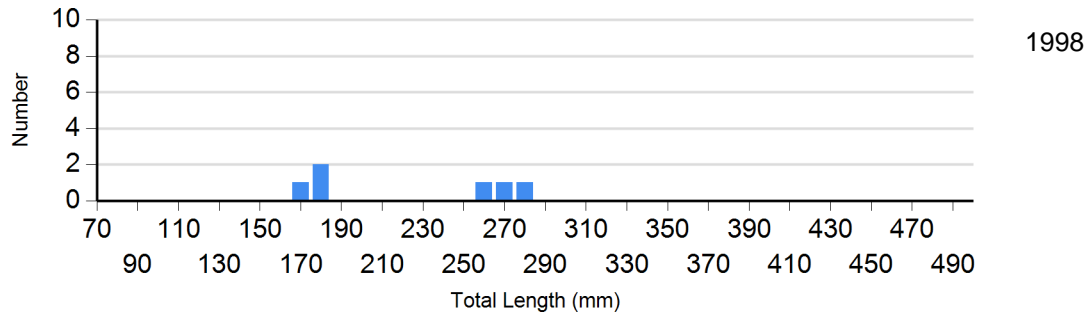
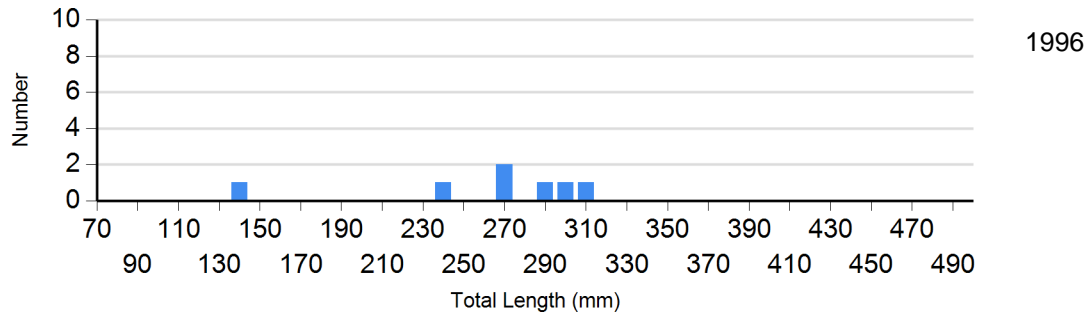
Site: 407
Species: Brown Trout



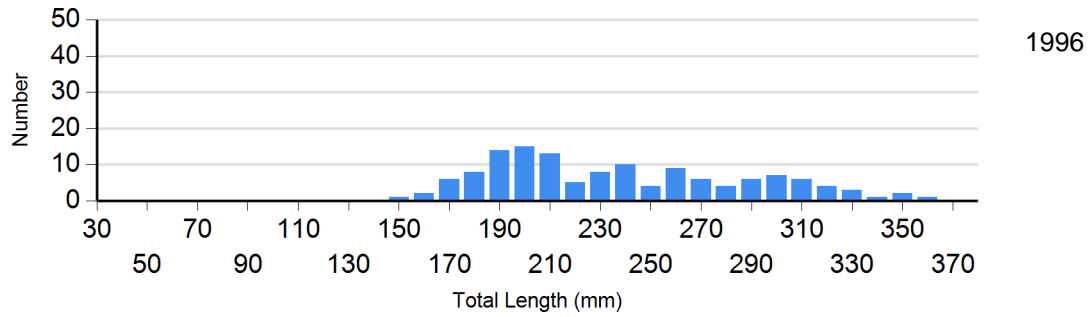
Site: 411
Species: Brook Trout

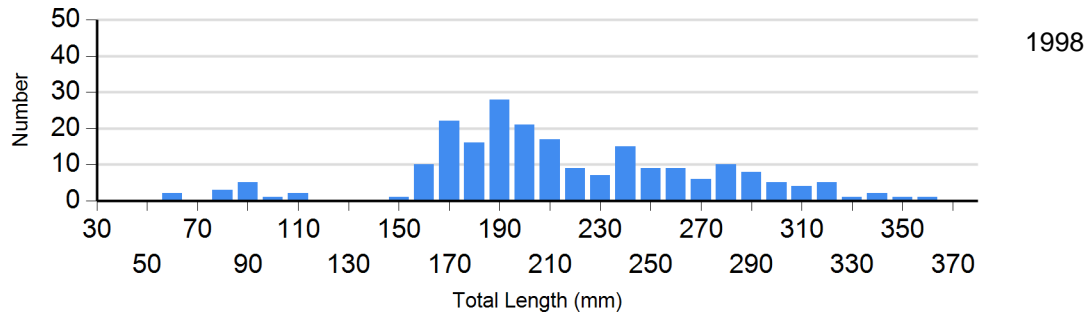
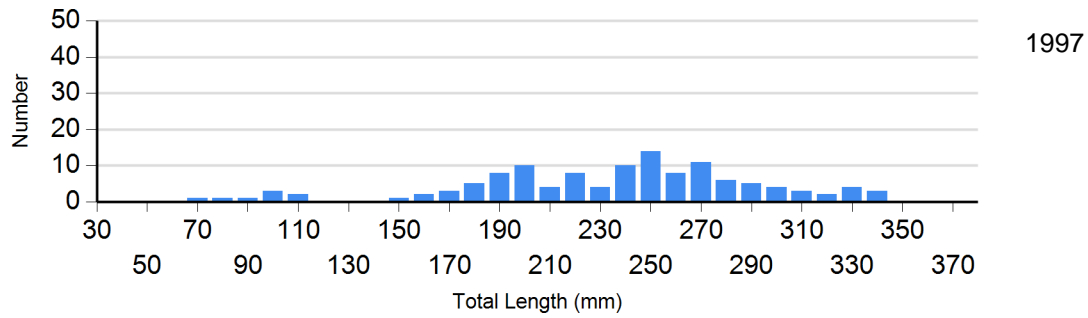


Site: 411
Species: Brown Trout

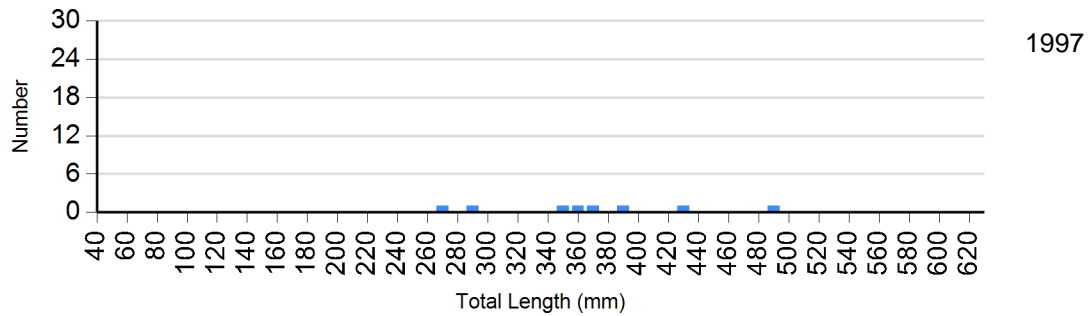
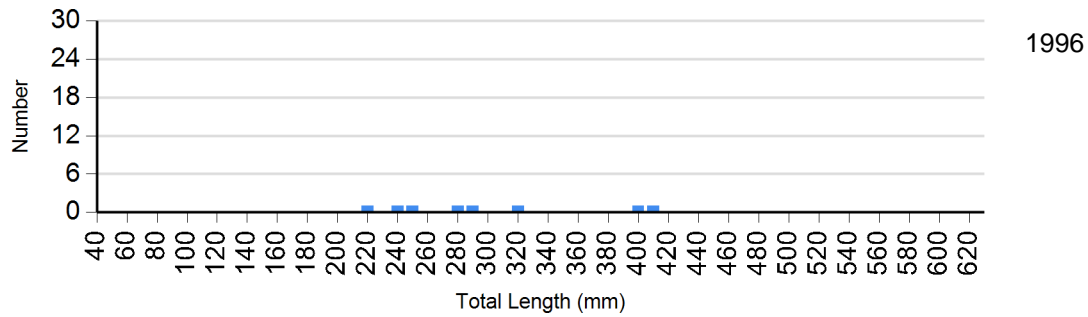


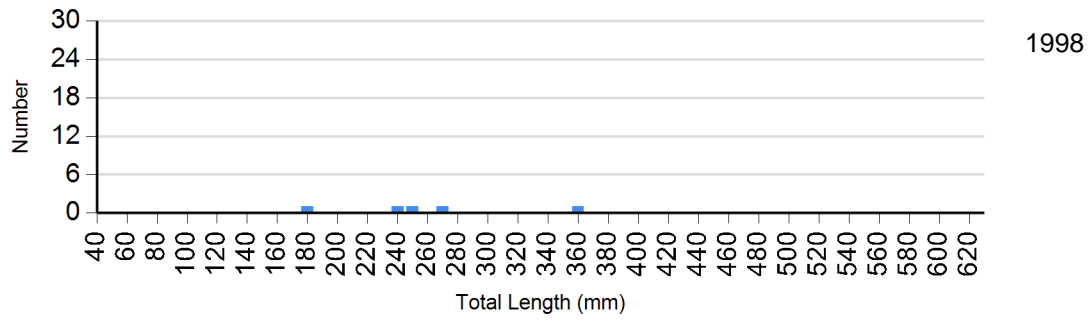
Site: 417
Species: Brook Trout





Site: 417
Species: Brown Trout





Site: 417
Species: White Sucker

