

SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY
Castle Creek, Pennington County
02-0071-00
2000

Table 1. Population and Biomass Estimates for Castle Creek

Site Number: 356	Date Sampled: 09/27/2000	Conductivity (umhos/cm): 280
Site Midpoint (Latitude, Longitude): 44.05717425, -103.76307493	Site Length (m): 100	pH: 9.0
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 3.0	Water Temperature (C): 14.0
Stream Classification: BK1, BR1	Number of Pass: 3	Voltage:

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	118	120	124	118	3964	97	1200	1605	86.77	1931	123.0	24.5
Brook Trout	>=200mm	49	49	50	49	1619	193	490	656	172.48	788	229.1	119.3
Brook Trout	All	167	169	173	167	5583	292	1690	2261	260.90	2719	154.1	52.3
Brown Trout	<200mm	226	239	250	228	7895	118	2390	3197	105.18	3846	100.9	14.9
Brown Trout	>=200mm	73	73	75	73	2411	385	730	977	343.79	1175	252.0	159.7
Brown Trout	All	299	312	322	302	10306	518	3120	4174	462.51	5020	137.8	50.3

Site Number: 384	Date Sampled: 09/25/2000	Conductivity (umhos/cm): 280
Site Midpoint (Latitude, Longitude): 44.04396904, -103.77363060	Site Length (m): 100	pH: 8.9
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 2.1	Water Temperature (C): 10.0
Stream Classification: BK1, BR1	Number of Pass: 3	Voltage:

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	159	164	170	159	7912	207	1640	3204	184.75	2639	125.6	26.2
Brook Trout	>=200mm	34	35	38	34	1689	204	350	684	182.17	563	226.1	120.8
Brook Trout	All	193	200	207	193	9649	413	2000	3908	368.99	3218	143.3	42.8

Brown Trout	<200mm	43	43	45	43	2075	28	430	840	25.20	692	91.1	13.6
Brown Trout	>=200mm	60	60	62	60	2895	730	600	1172	651.59	965	283.9	252.1
Brown Trout	All	104	105	108	104	5066	773	1050	2052	689.93	1689	203.4	152.5

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: 09/25/2000 **Conductivity (umhos/cm):** 311
Site Length (m): 100
Mean Width (m): 3.7 **pH:** 8.9
Number of Pass: 3 **Water Temperature (C):** 13.1
Voltage:

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	158	163	169	158	4405	99	1630	1784	88.55	2623	116.7	22.5
Brook Trout	>=200mm	22	22	24	22	595	69	220	241	61.17	354	225.0	115.2
Brook Trout	All	183	188	194	183	5081	172	1880	2058	153.54	3025	129.9	33.8
Brown Trout	<200mm	43	47	55	43	1270	8	470	514	7.20	756	79.0	6.3
Brown Trout	>=200mm	53	53	54	53	1432	343	530	580	305.87	853	282.5	239.2
Brown Trout	All	96	98	102	96	2649	357	980	1073	318.97	1577	191.3	134.9

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: 09/26/2000 **Conductivity (umhos/cm):** 300
Site Length (m): 107
Mean Width (m): 4.3 **pH:** 8.6
Number of Pass: 3 **Water Temperature (C):** 12.0
Voltage:

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	201	212	222	202	4962	116	1981	2009	103.75	3188	123.4	23.4
Brook Trout	>=200mm	22	22	23	22	515	62	206	209	55.17	331	224.6	120.0
Brook Trout	All	223	233	242	224	5453	180	2178	2209	160.42	3504	133.4	32.9

Brown Trout	<200mm	10	10	12	10	234	3	93	95	2.99	150	97.6	14.3
Brown Trout	>=200mm	46	47	50	46	1100	242	439	446	216.33	707	273.2	220.3
Brown Trout	All	56	58	62	56	1357	249	542	550	222.39	872	241.8	183.5

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: 09/26/2000
Site Length (m): 105
Mean Width (m): 4.4
Number of Pass: 3
Conductivity (umhos/cm): 290
pH: 8.7
Water Temperature (C): 12.0
Voltage:

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	154	182	206	158	4154	116	1733	1682	103.43	2789	127.4	27.9
Brook Trout	>=200mm	47	47	49	47	1073	175	448	434	155.96	720	245.1	162.9
Brook Trout	All	201	225	244	206	5135	305	2143	2080	272.55	3448	154.9	59.4
Brown Trout	<200mm	16	16	16	16	365	5	152	148	4.67	245	102.1	14.3
Brown Trout	>=200mm	40	40	40	40	913	288	381	370	257.20	613	303.7	315.6
Brown Trout	All	56	56	56	56	1278	293	533	518	261.86	858	246.1	229.5

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: 09/27/2000
Site Length (m): 100
Mean Width (m): 5.5
Number of Pass: 3
Conductivity (umhos/cm):
pH:
Water Temperature (C):
Voltage:

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	183	199	213	185	3648	173	1990	1478	154.63	3202	159.6	47.5
Brook Trout	>=200mm	266	271	277	266	4968	871	2710	2012	777.43	4360	249.5	175.3
Brook Trout	All	449	467	479	455	8562	1055	4670	3467	941.58	7514	212.9	123.2

Brown Trout	>=200mm	15	15	17	15	275	118	150	111	105.70	241	338.8	430.5
Brown Trout	All	15	15	17	15	275	118	150	111	105.70	241	338.8	430.5
Hatchery Rainbow Trout	>=200mm	2	2	4	2	37	12	20	15	10.53	32	299.5	321.5
Hatchery Rainbow Trout	All	2	2	4	2	37	12	20	15	10.53	32	299.5	321.5

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, 1990-2000

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	Sep 21, 1999	105	99-113	
	Sep 27, 2000	120	118-124	
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
	Sep 21, 1999	47	45-52	BK1
	Sep 27, 2000	49	49-50	BK1
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	

Brown Trout <200mm	Sep 12, 1997	123	109-138	
	Sep 29, 1998	91	80-105	
	Sep 21, 1999	163	153-173	
	Sep 27, 2000	239	228-250	
Brown Trout >=200mm	Oct 16, 1992	23	23-24	BR1
	Oct 13, 1993	25	25-25	BR1
	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
	Sep 21, 1999	109	107-113	BR1
	Sep 27, 2000	73	73-75	BR1

Site 384

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Oct 14, 1992	127	109-146	

Brook Trout <200mm	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	
	Sep 20, 1999	101	76-133	
	Sep 25, 2000	164	159-170	
Brook Trout >=200mm	Oct 14, 1992	11	11-12	BK2
	Oct 12, 1993	21	21-21	BK1
	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
	Sep 20, 1999	28	26-34	BK1

Brook Trout >=200mm	Sep 25, 2000	35	34-38	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	
	Sep 20, 1999	39	34-49	
	Sep 25, 2000	43	43-45	
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
	Sep 16, 1996	32	29-39	BR1
	Sep 12, 1997	33	27-46	BR1

Brown Trout >=200mm	Sep 23, 1998	40	40-41	BR1
	Sep 20, 1999	67	61-76	BR1
	Sep 25, 2000	60	60-62	BR1

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	
	Sep 20, 1999	81	78-86	
	Sep 25, 2000	163	158-169	
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
	Sep 20, 1999	22	22-24	BK1
	Sep 25, 2000	22	22-24	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	
	Sep 20, 1999	15	16-24	
	Sep 25, 2000	47	43-55	
Brown Trout >=200mm	Oct 14, 1992	27	27-28	BR1

Brown Trout >=200mm	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
	Sep 16, 1997	2	2-6	BR3
	Sep 23, 1998	24	24-26	BR1
	Sep 20, 1999	53	53-54	BR1
	Sep 25, 2000	53	53-54	BR1

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	
	Sep 22, 1999	116	109-125	
	Sep 26, 2000	212	202-222	
Brook Trout >=200mm	Sep 17, 1996	31	31-32	BK1

Brook Trout >=200mm	Sep 16, 1997	10	11-16	BK2
	Sep 24, 1998	45	43-50	BK1
	Sep 22, 1999	37	37-39	BK1
	Sep 26, 2000	22	22-23	BK1
Brown Trout <200mm	Sep 16, 1997	17	18-22	
	Sep 24, 1998	39	28-63	
	Sep 22, 1999	19	15-31	
	Sep 26, 2000	10	10-12	
Brown Trout >=200mm	Sep 17, 1996	20	20-20	BR1
	Sep 16, 1997	13	13-14	BR2
	Sep 24, 1998	27	24-34	BR1
	Sep 22, 1999	63	50-83	BR1
	Sep 26, 2000	47	46-50	BR1

Site 407

Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 18, 1996	57	48-71	

Brook Trout <200mm	Sep 17, 1997	73	59-92	
	Sep 24, 1998	126	116-137	
	Sep 22, 1999	124	117-133	
	Sep 26, 2000	182	158-206	
Brook Trout >=200mm	Sep 18, 1996	23	23-25	BK1
	Sep 17, 1997	15	14-19	BK2
	Sep 24, 1998	40	40-42	BK1
	Sep 22, 1999	55	53-59	BK1
	Sep 26, 2000	47	47-49	BK1
Brown Trout <200mm	Sep 18, 1996	2	2-6	
	Sep 17, 1997	2	2-3	
	Sep 24, 1998	6	6-6	
	Sep 22, 1999	1	1-1	
	Sep 26, 2000	16	16-16	
Brown Trout >=200mm	Sep 18, 1996	21	21-23	BR1
	Sep 17, 1997	11	11-13	BR2

Brown Trout >=200mm	Sep 24, 1998	18	18-19	BR1
	Sep 22, 1999	31	30-34	BR1
	Sep 26, 2000	40	40-40	BR1

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	
	Sep 27, 1999	72	72-74	
	Sep 27, 2000	199	185-213	
Brook Trout >=200mm	Sep 24, 1996	104	104-106	BK1
	Sep 18, 1997	112	96-130	BK1
	Sep 22, 1998	150	131-169	BK1
	Sep 27, 1999	189	188-191	BK1
	Sep 27, 2000	271	266-277	BK1
Brown Trout <200mm	Sep 22, 1998	1	1-1	

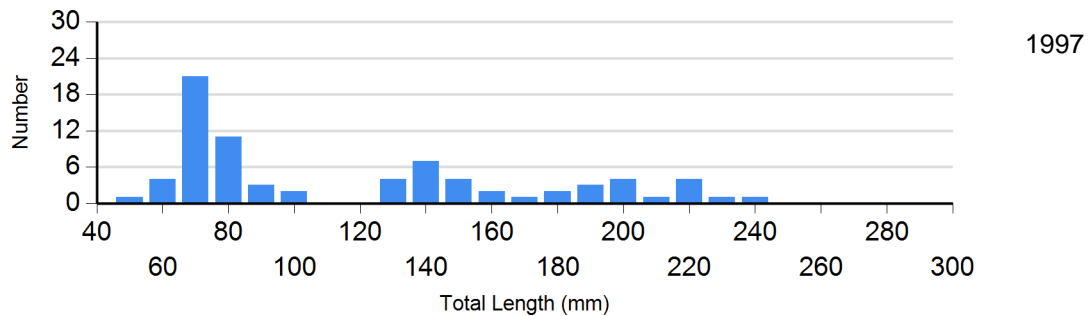
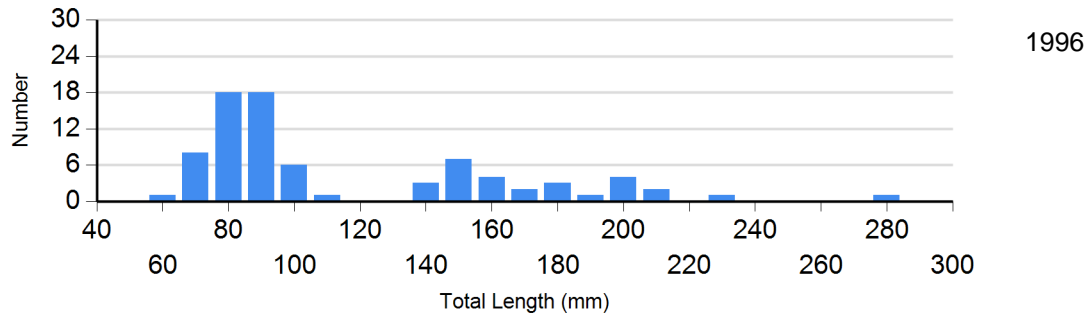
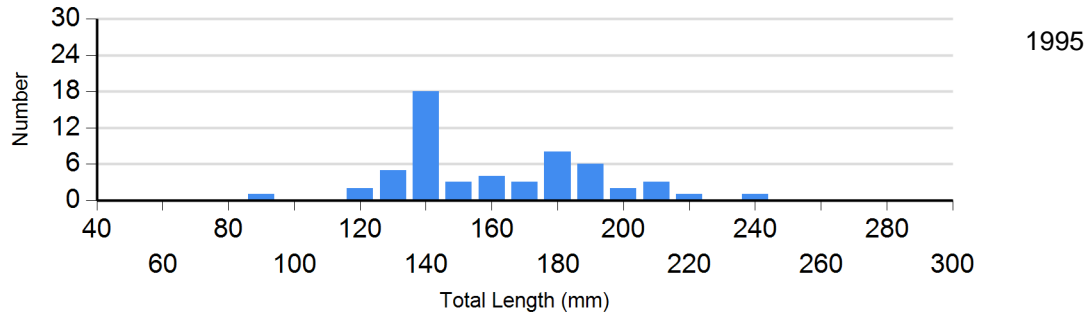
Brown Trout >=200mm	Sep 24, 1996	8	8-8	BR2
	Sep 18, 1997	8	8-10	BR2
	Sep 22, 1998	4	4-6	BR2
	Sep 27, 1999	16	16-16	BR2
	Sep 27, 2000	15	15-17	BR2
Hatchery Rainbow Trout >=200mm	Sep 27, 1999	1	1-1	
	Sep 27, 2000	2	2-4	

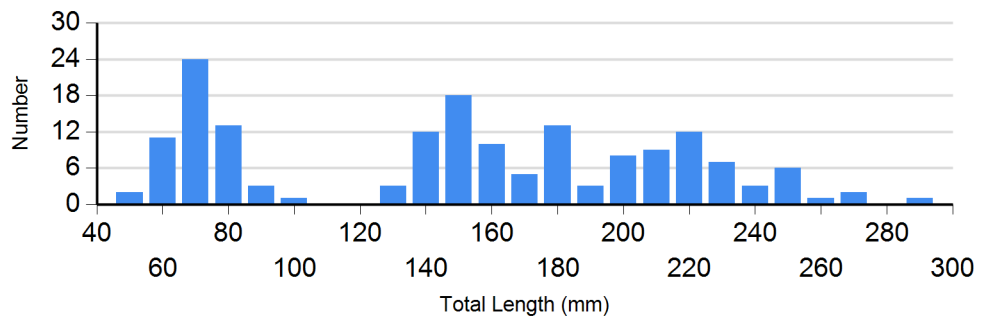
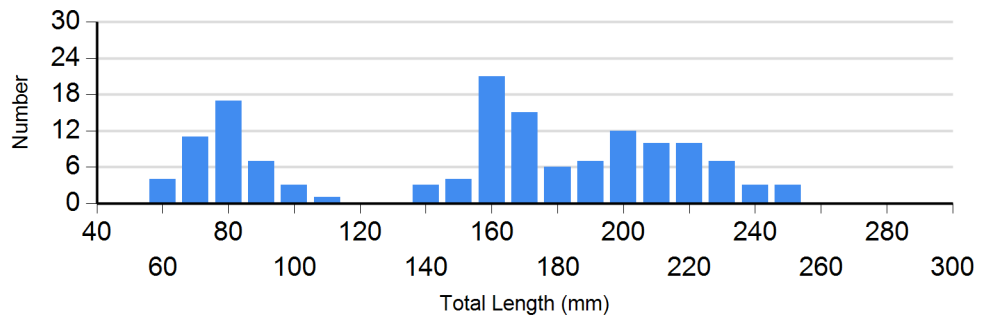
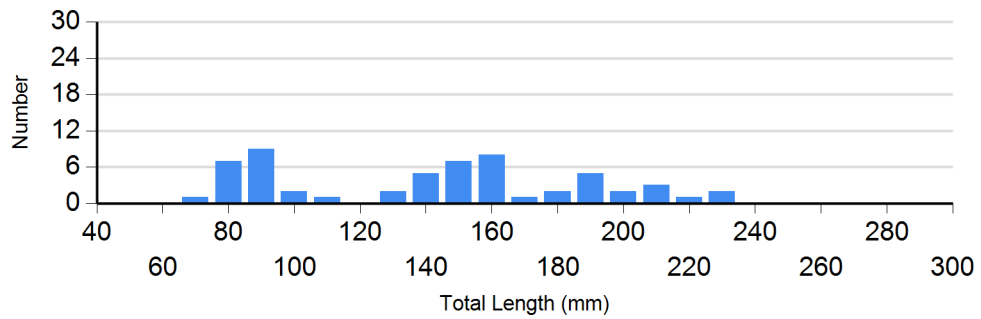
Length Frequency Distribution

Length frequency histogram of species sampled by year.

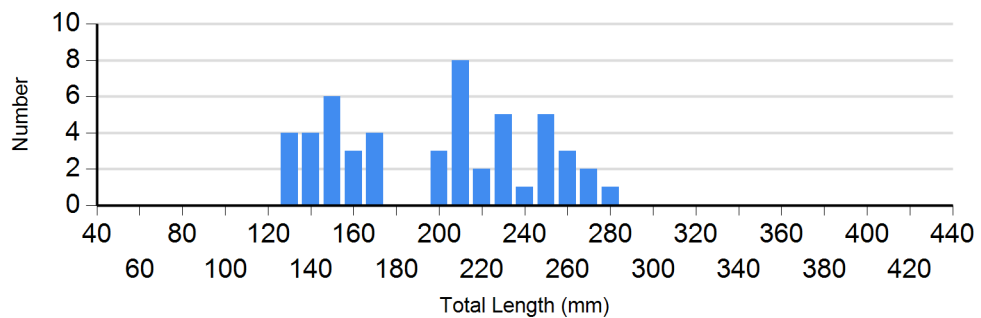
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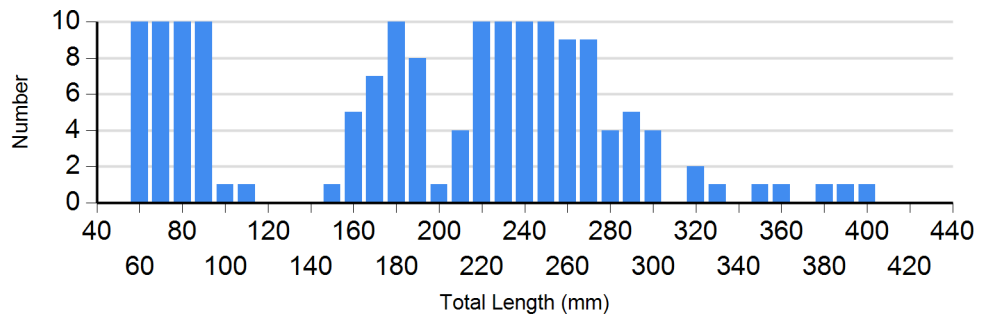
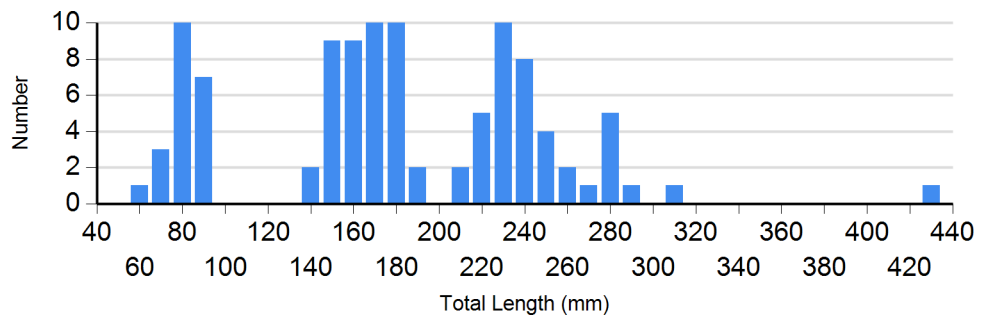
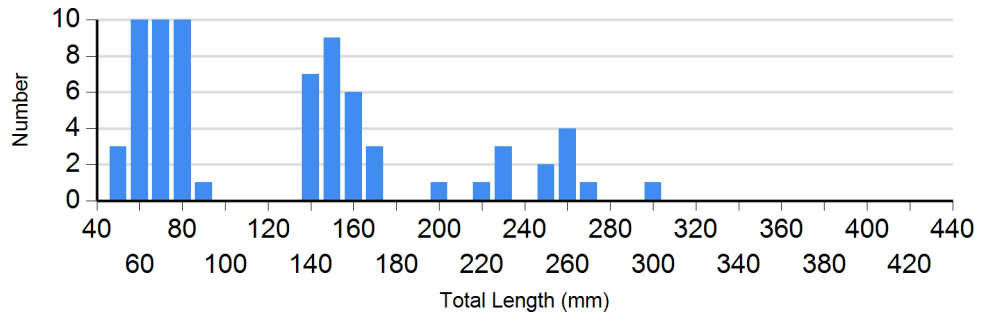
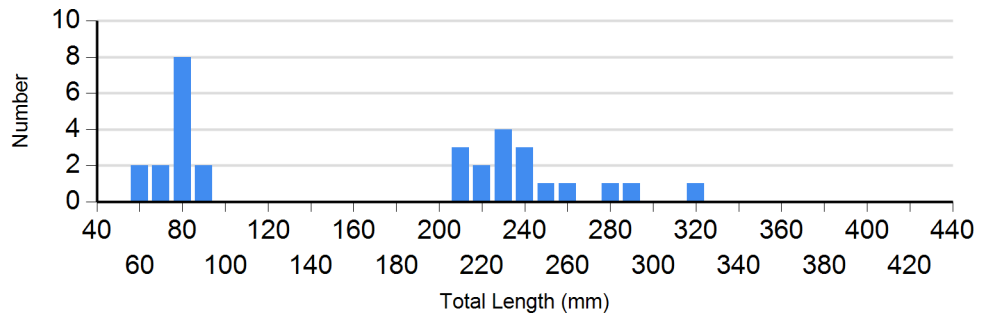
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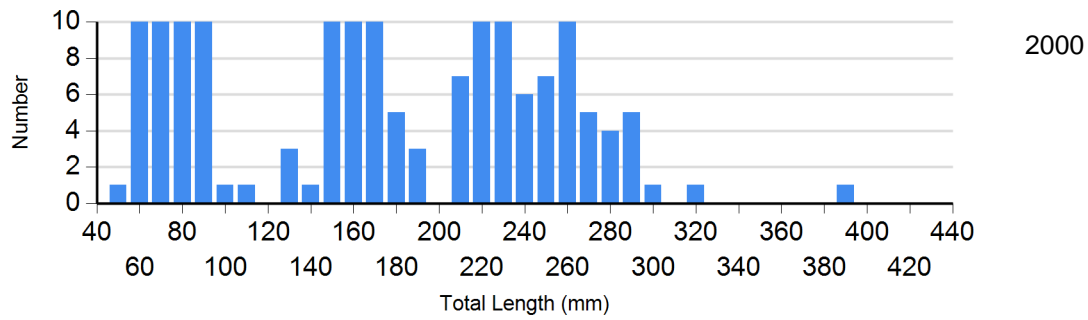




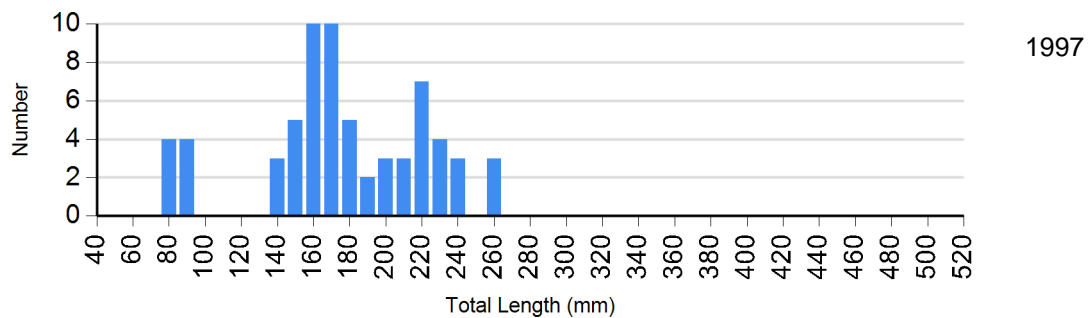
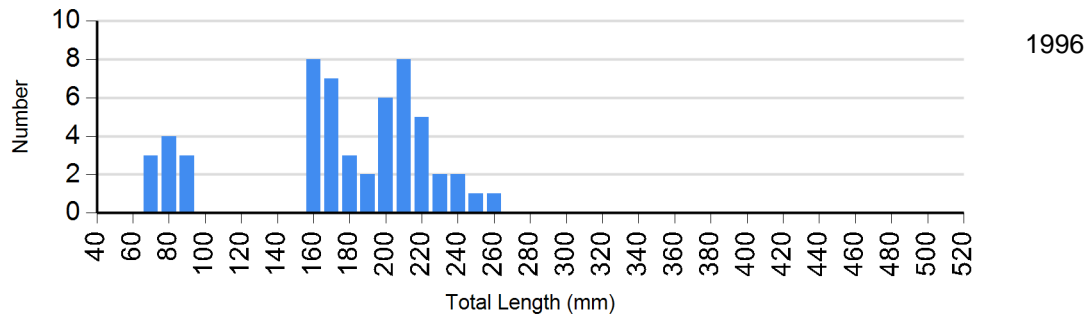
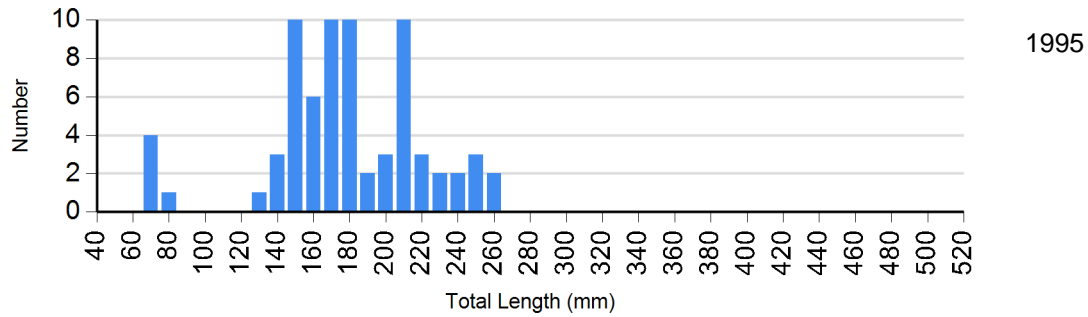
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Species: Brown Trout

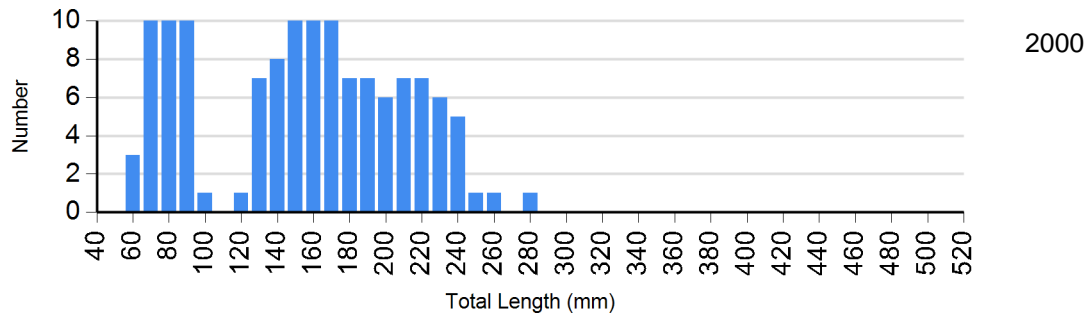
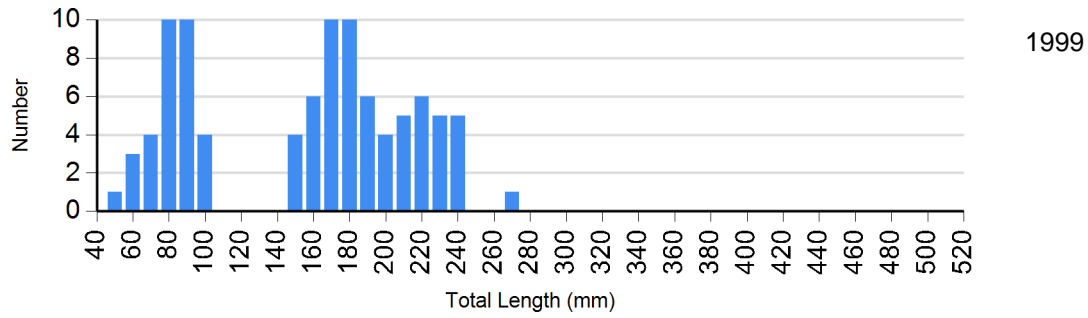
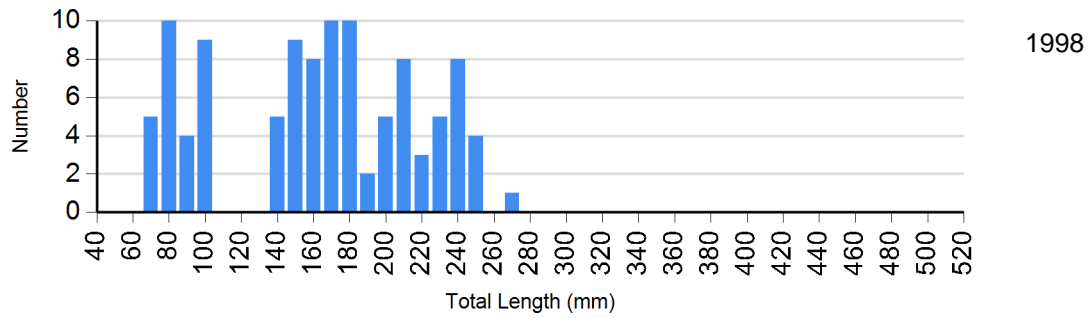




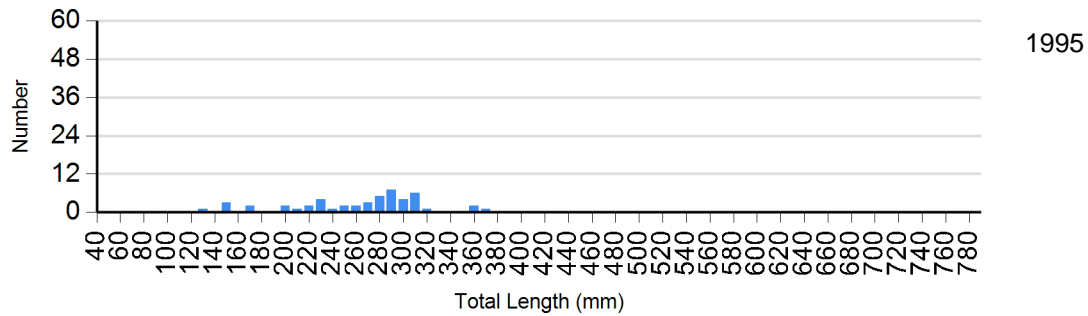


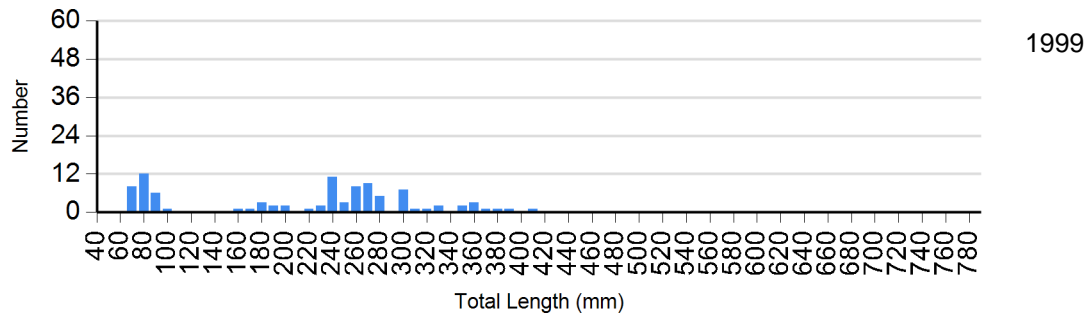
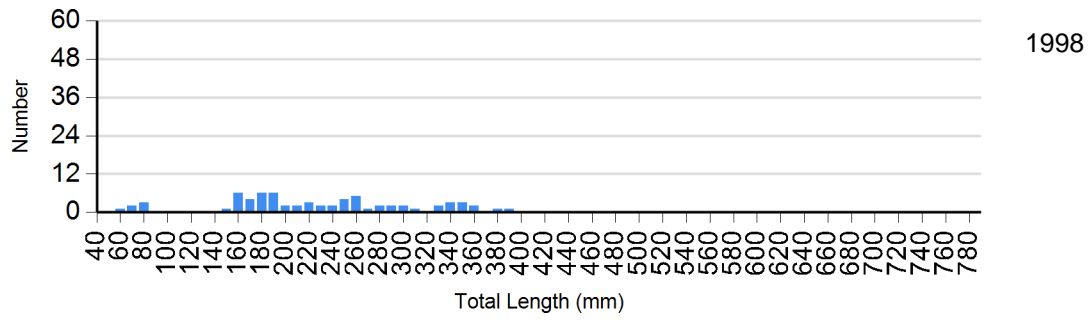
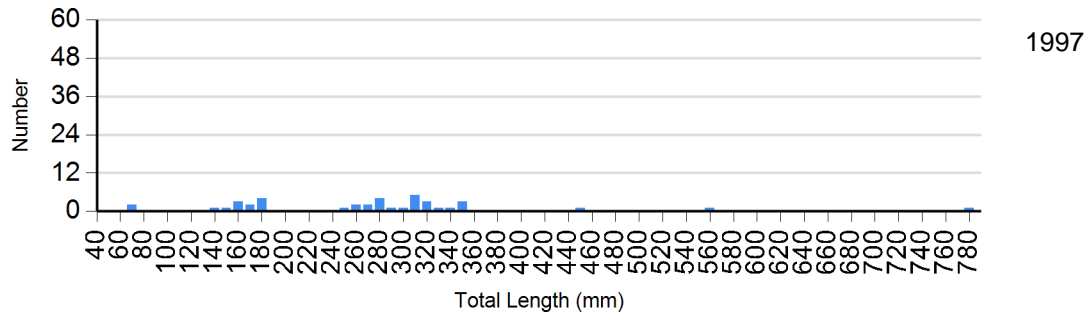
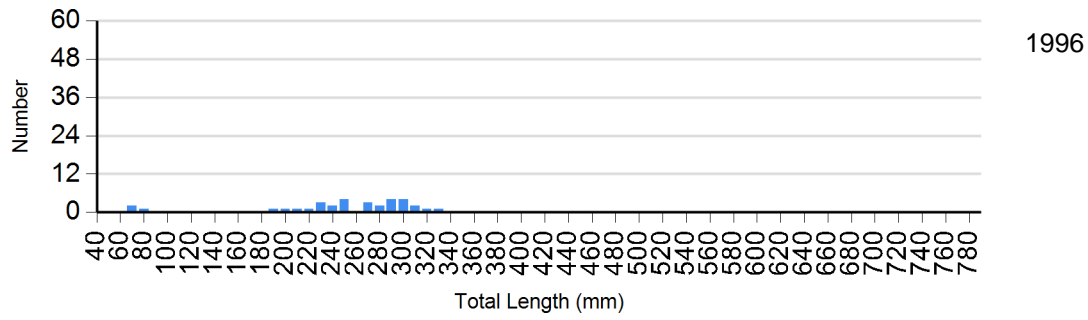
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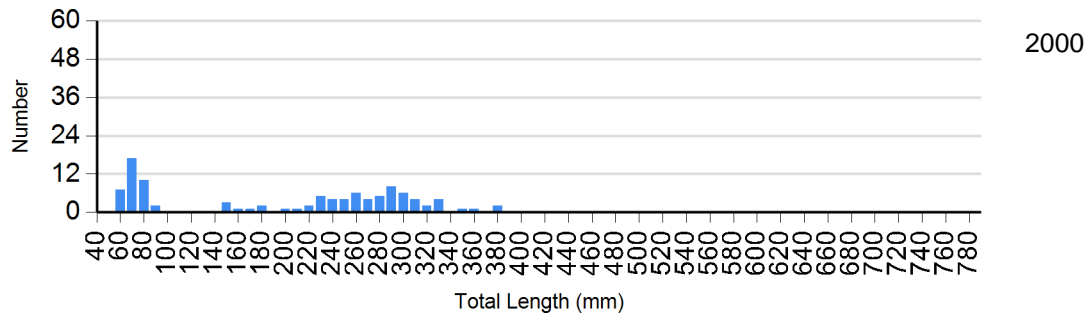




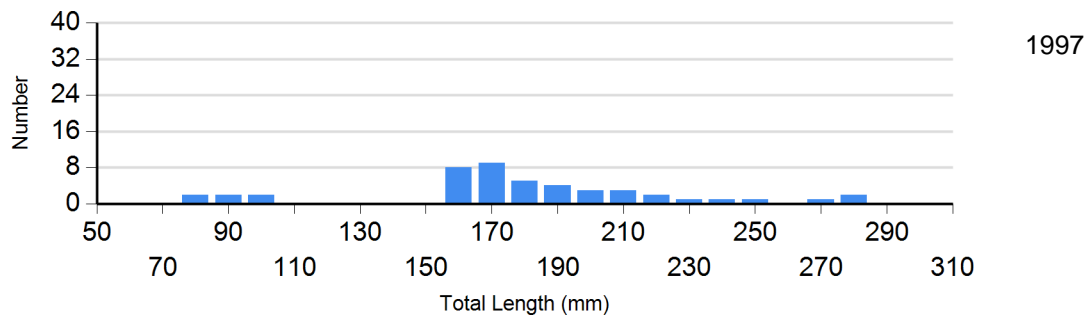
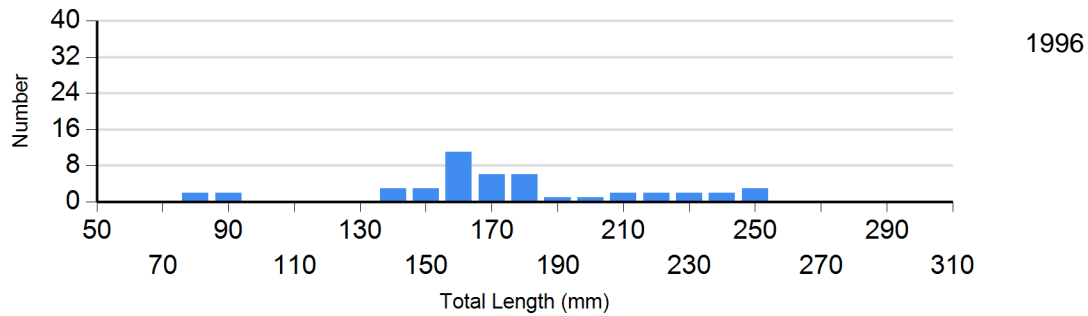
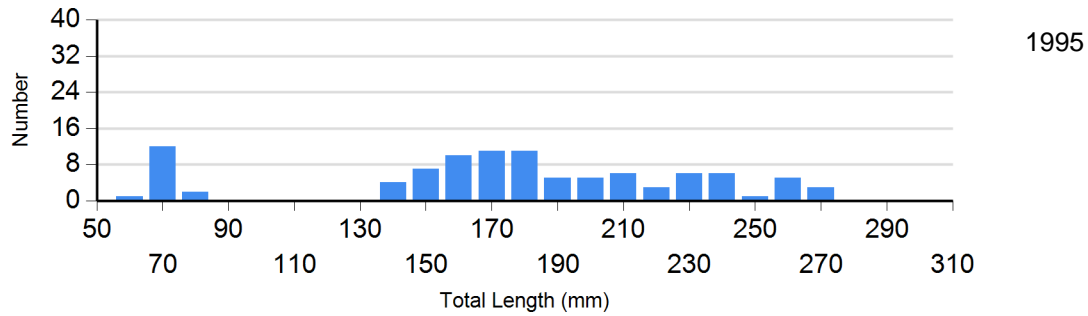
Site: 384
Species: Brown Trout

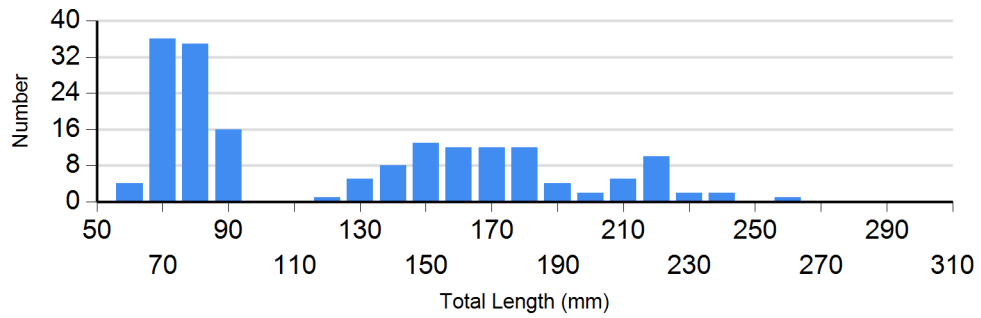
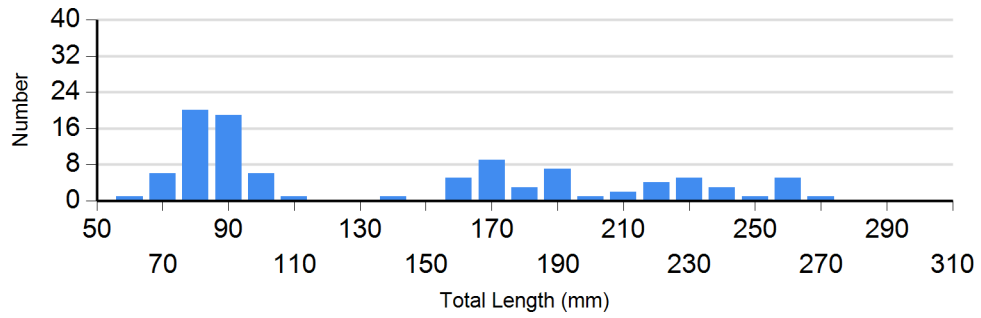
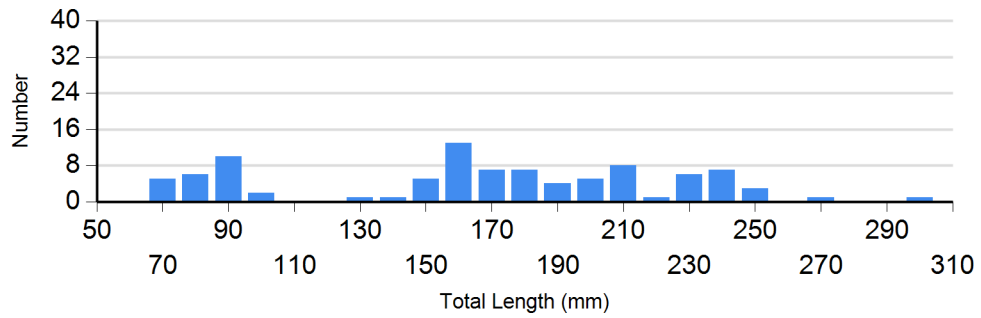




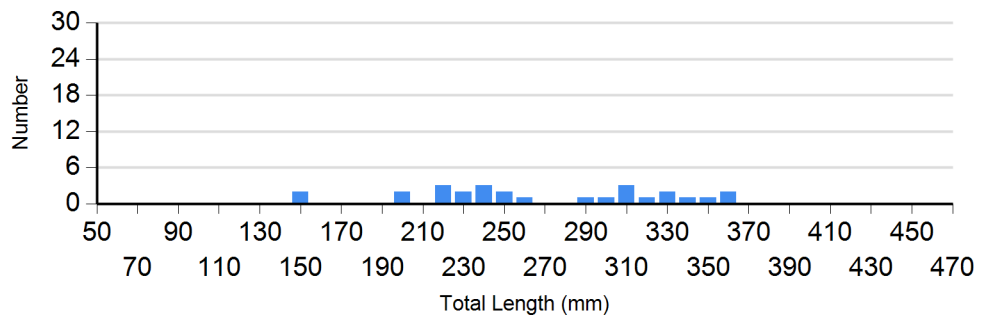


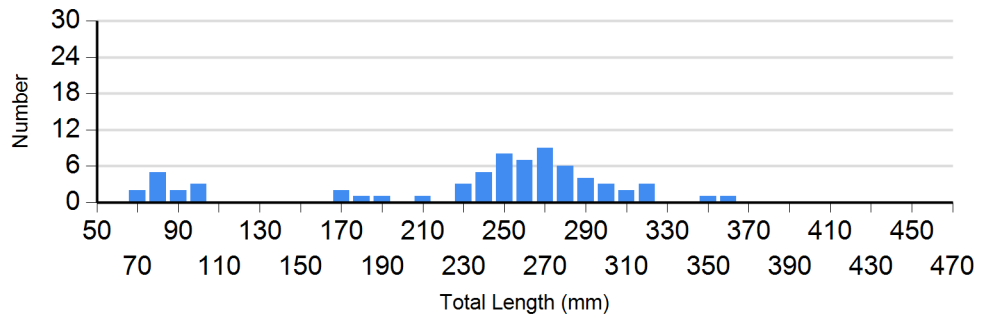
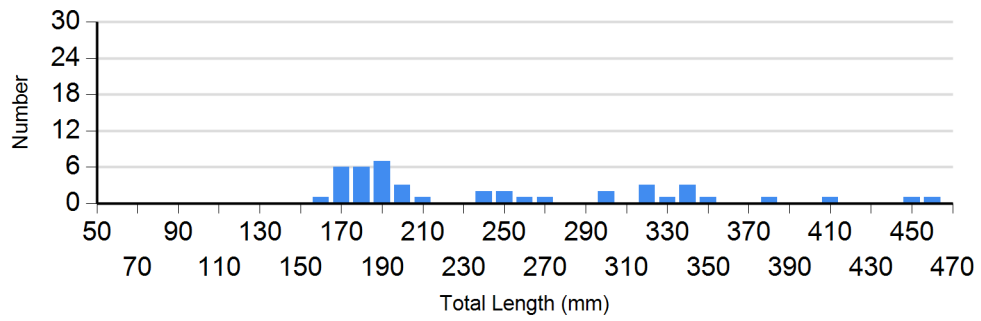
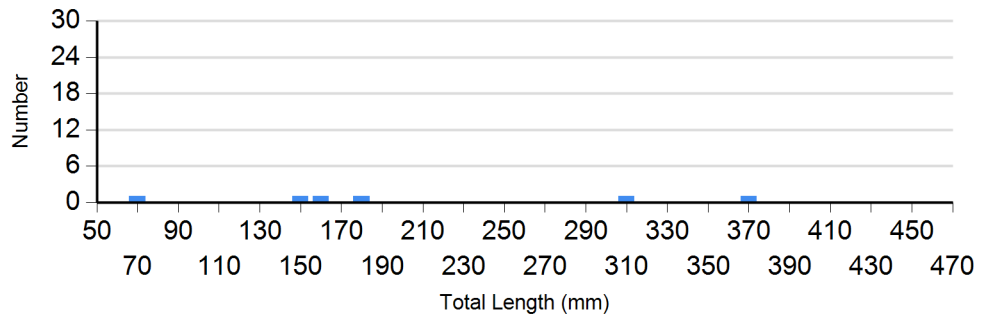
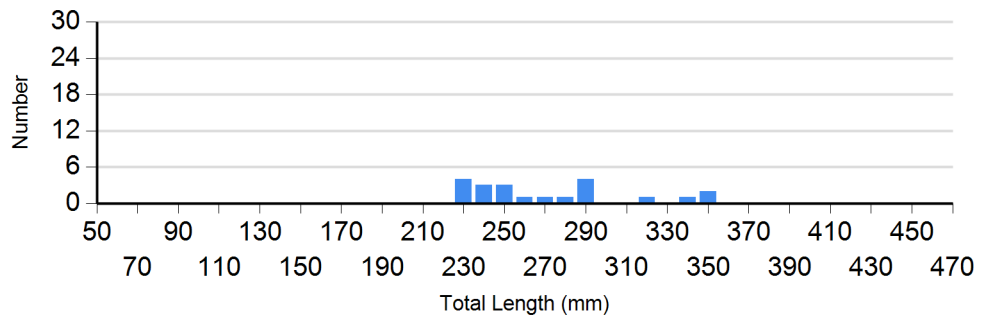
Site: 388
Species: Brook Trout

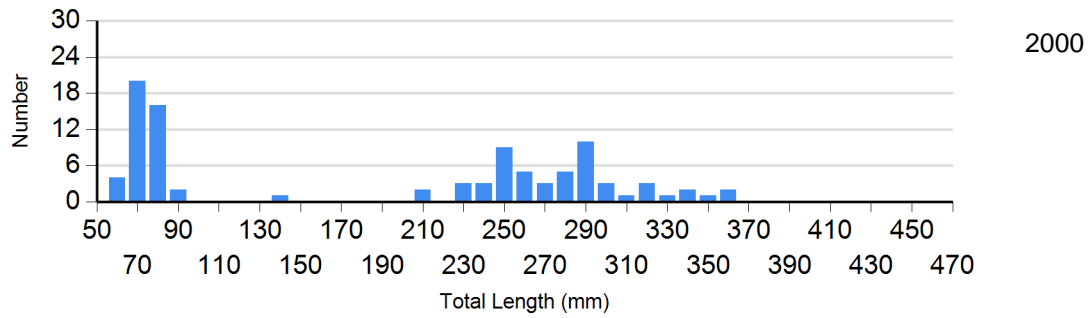




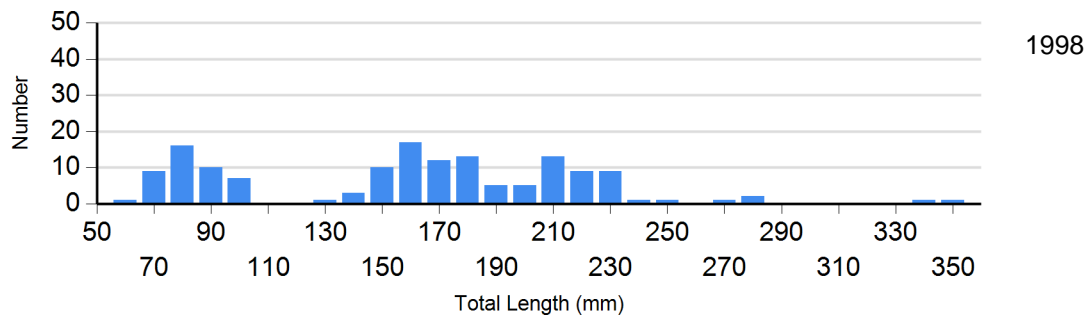
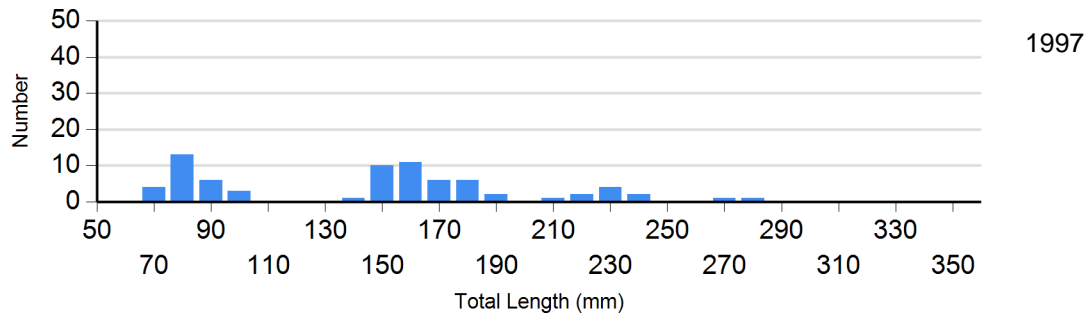
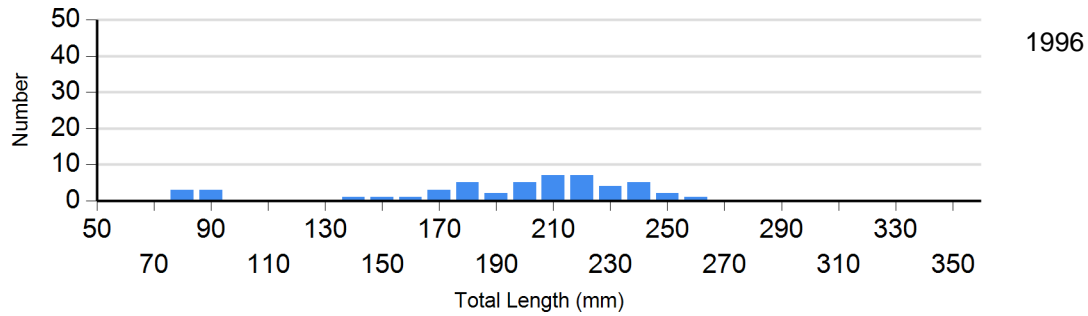
Site: 388
Species: Brown Trout

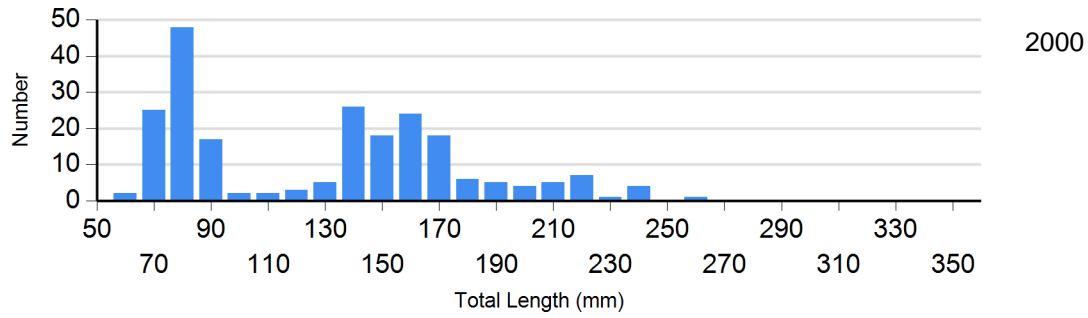
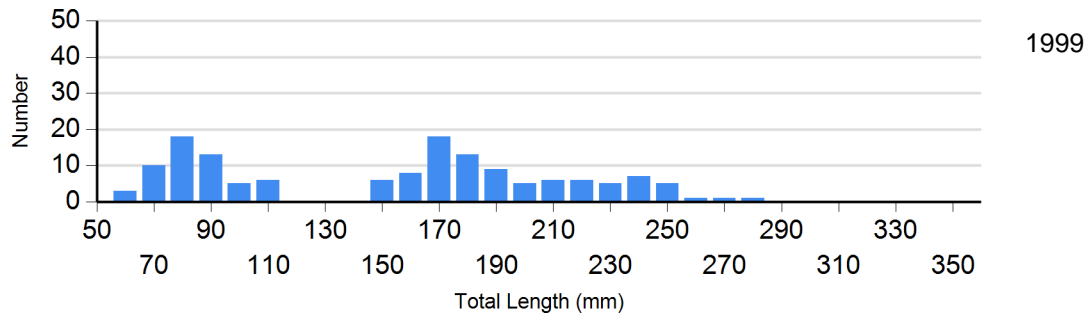




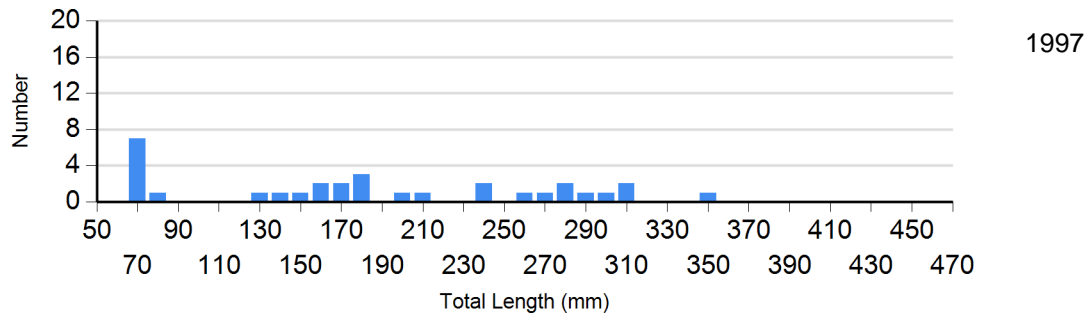
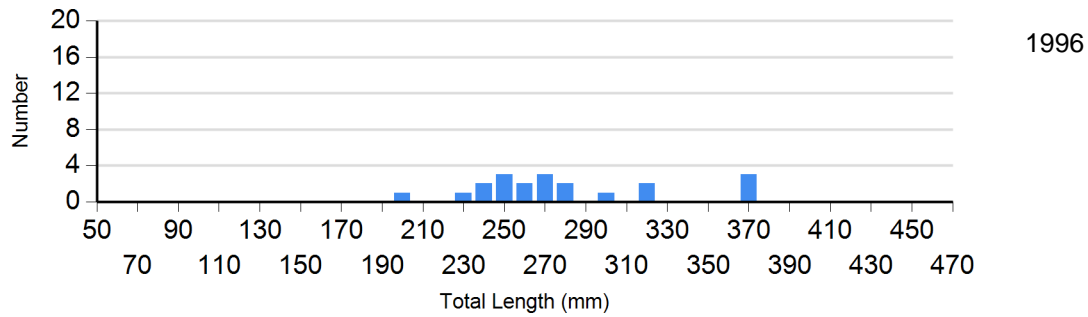


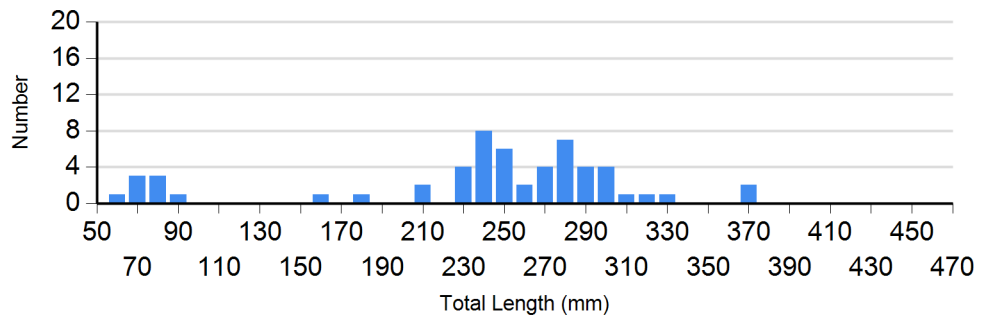
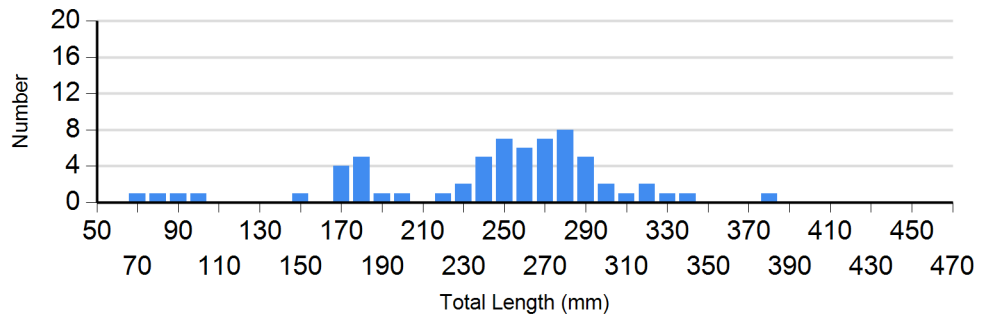
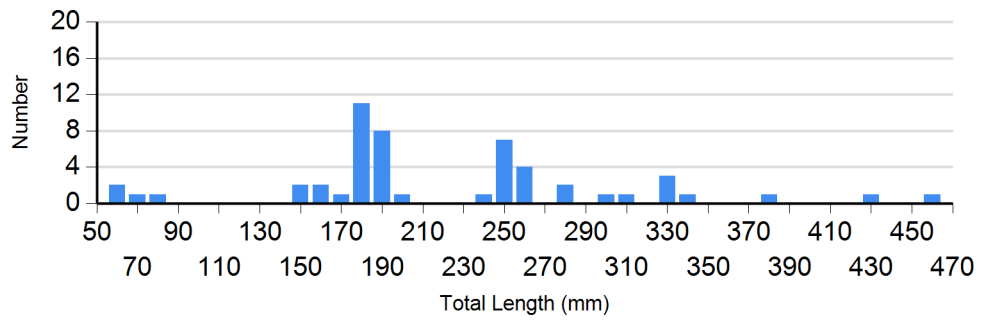
Site: 396
Species: Brook Trout



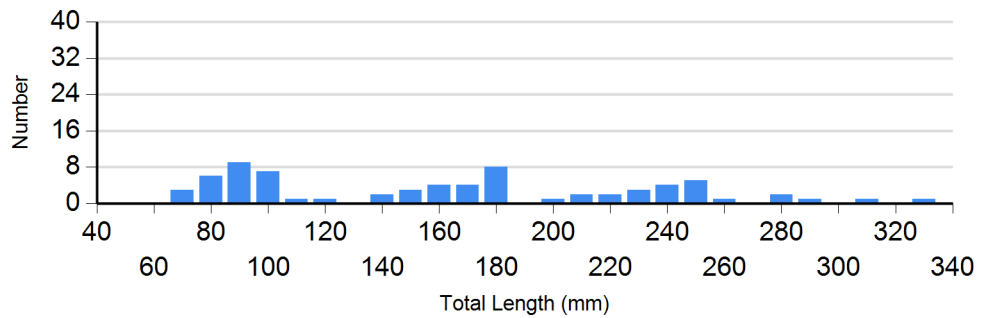


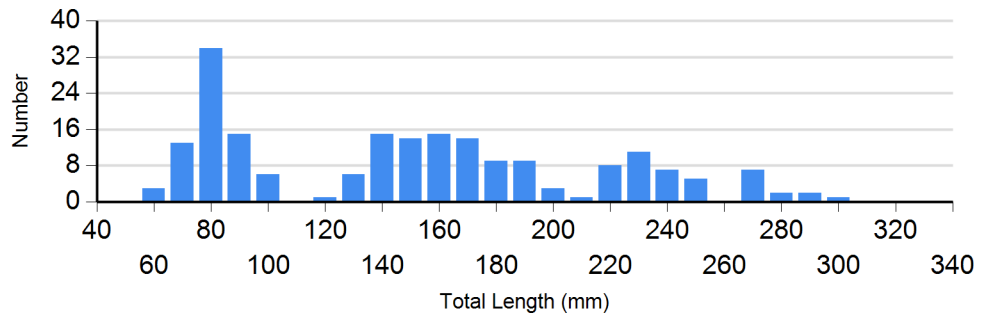
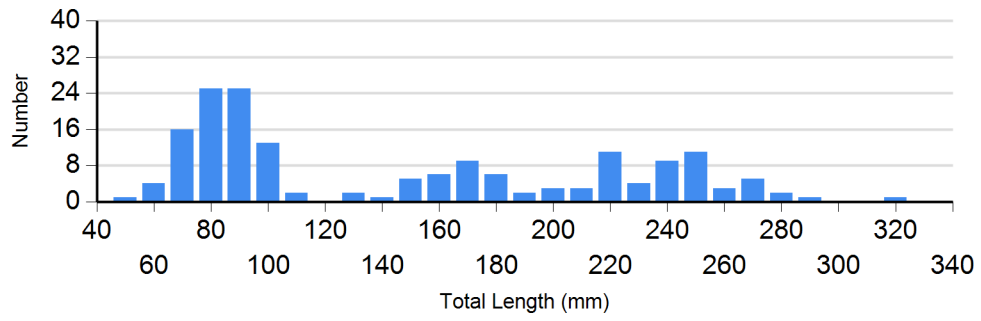
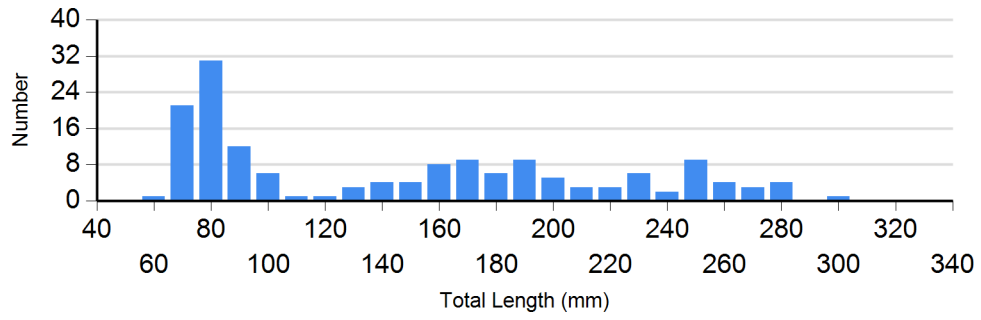
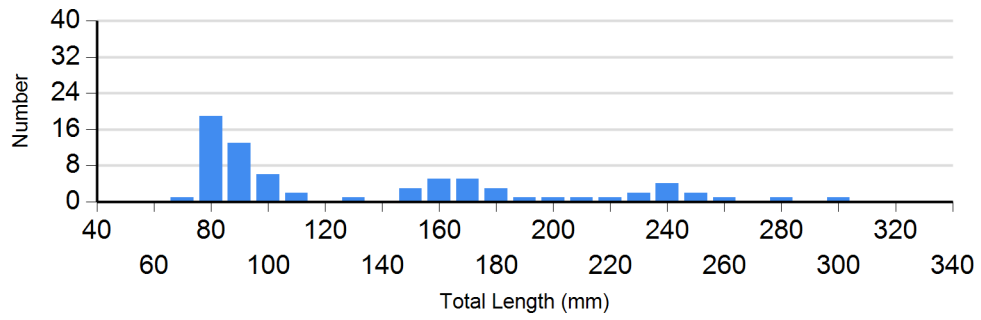
Site: 396
Species: Brown Trout



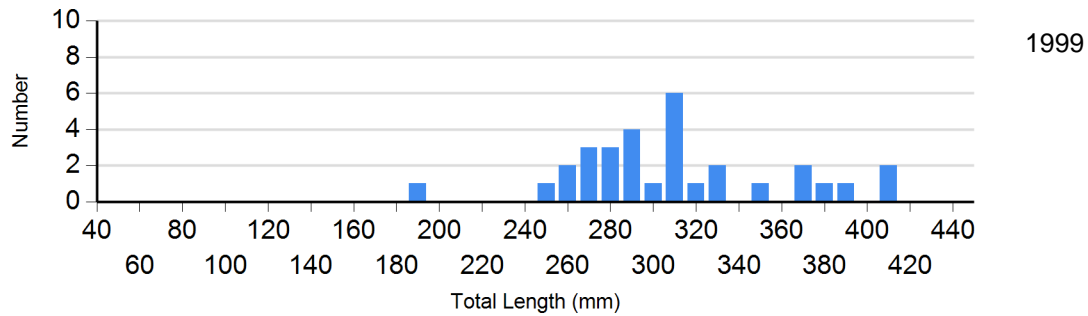
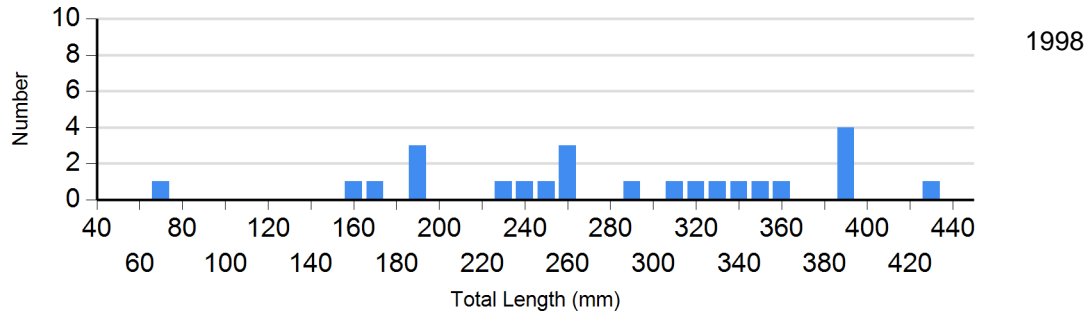
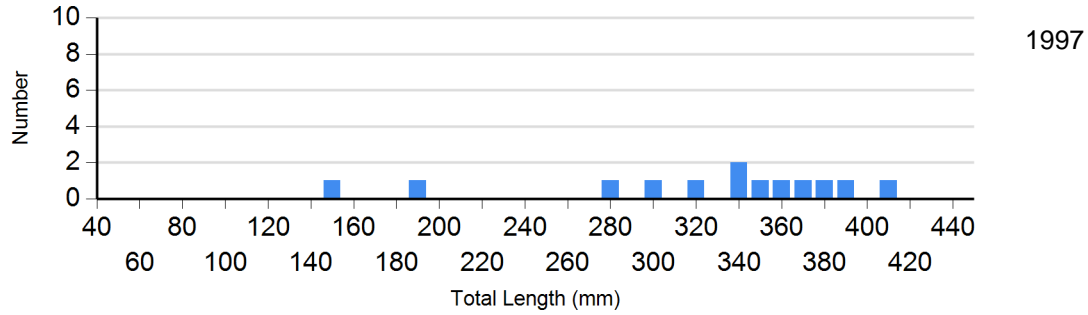
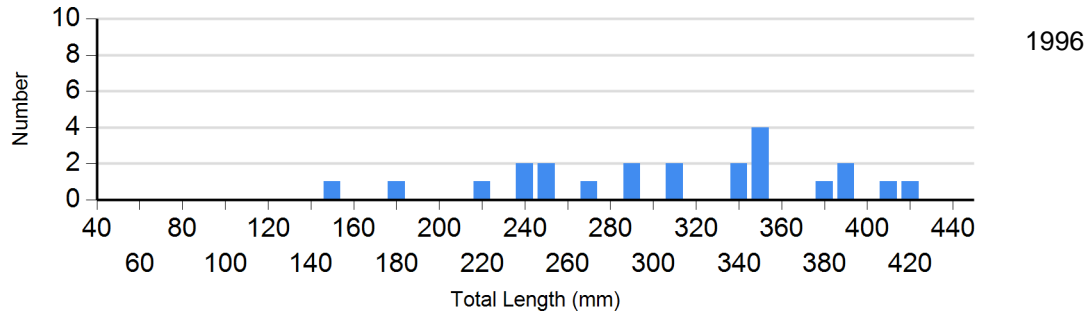


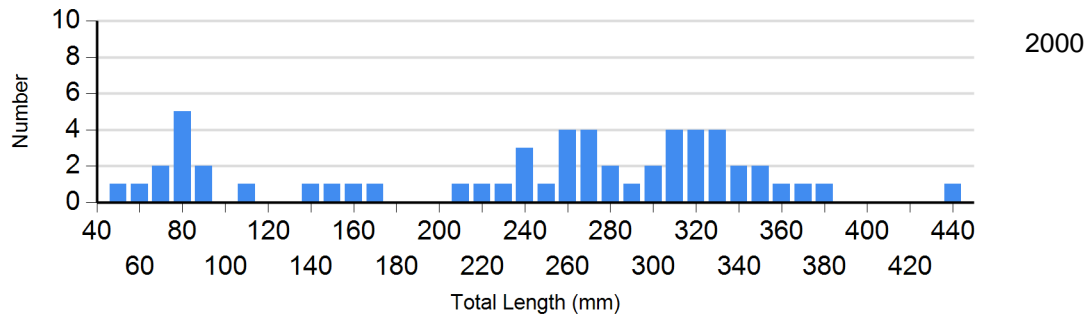
Site: 407
Species: Brook Trout



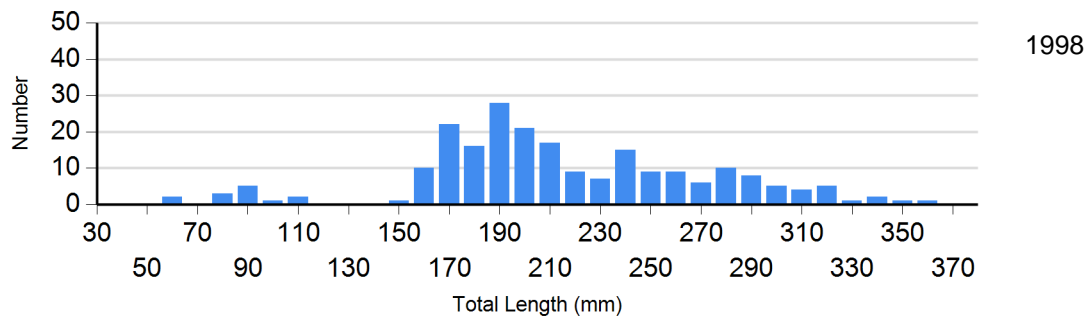
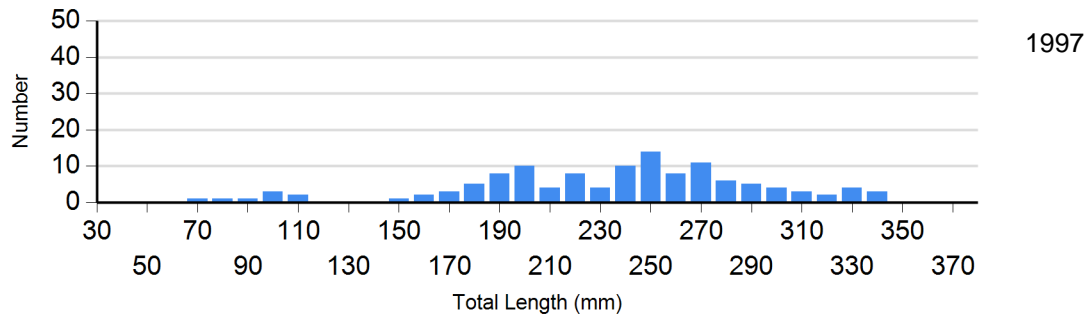
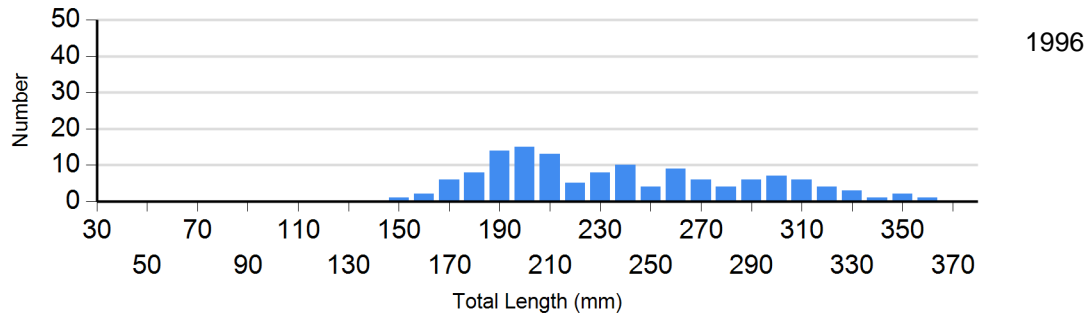


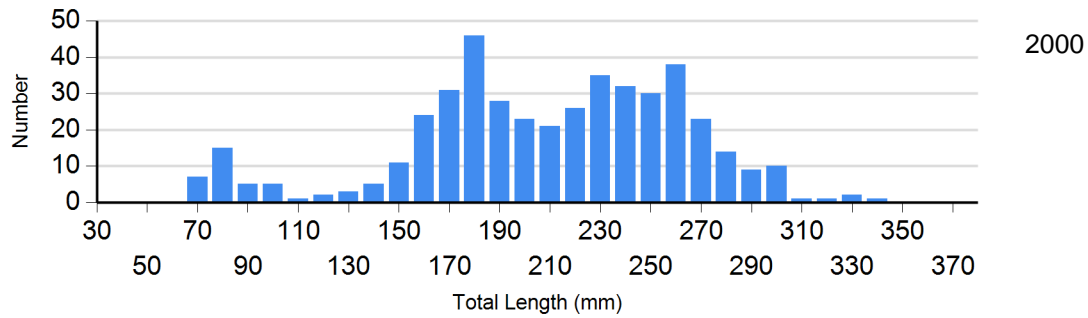
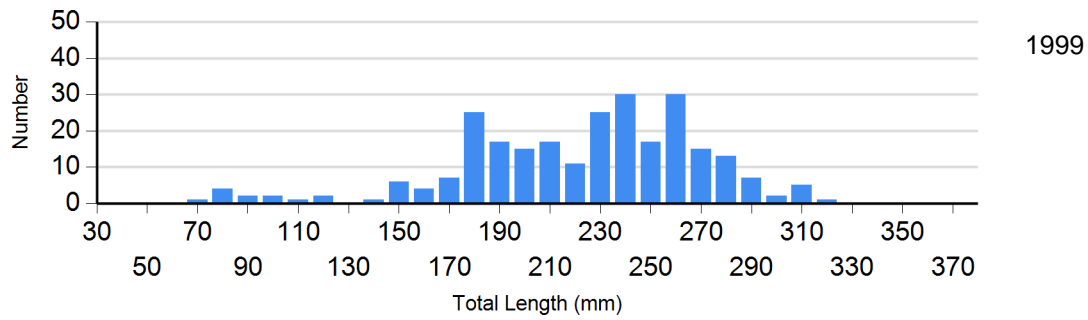
Site: 407
Species: Brown Trout





Site: 417
Species: Brook Trout





Site: 417
Species: Brown Trout

