

SOUTH DAKOTA BLACK HILLS COLD STREAM SURVEY
Castle Creek, Pennington County
02-0071-00
1997

Table 1. Population and Biomass Estimates for Castle Creek

Site Number: 356	Date Sampled: 09/12/1997	Conductivity (umhos/cm):	378
Site Midpoint (Latitude, Longitude): 44.05717425, -103.76307493	Site Length (m): 100	pH:	8.0
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 4.1	Water Temperature (C):	13.0
Stream Classification: BK1, BR2	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	65	77	93	65	1897	30	770	768	26.68	1239	106.1	15.8
Brook Trout	>=200mm	11	23	82	11	567	61	230	229	54.03	370	219.5	106.8
Brook Trout	All	76	97	123	76	2389	69	970	968	61.72	1561	122.5	28.9
Brown Trout	<200mm	109	123	138	109	3030	36	1230	1227	32.14	1979	91.9	11.9
Brown Trout	>=200mm	13	14	19	13	345	59	140	140	52.44	225	252.1	170.3
Brown Trout	All	122	140	158	122	3448	99	1400	1397	88.56	2253	108.9	28.8

Site Number: 384	Date Sampled: 09/12/1997	Conductivity (umhos/cm):	310
Site Midpoint (Latitude, Longitude): 44.04396904, -103.77363060	Site Length (m): 138	pH:	8.3
Survey Completed by: South Dakota Game, Fish and Parks	Mean Width (m): 4.2	Water Temperature (C):	16.0
Stream Classification: BK1, BR1	Number of Pass: 4	Voltage:	300

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	49	65	90	49	1548	62	471	627	55.19	758	155.8	39.9
Brook Trout	>=200mm	23	24	28	23	571	76	174	231	67.88	280	229.5	133.0
Brook Trout	All	72	88	108	72	2095	146	638	849	130.36	1026	179.3	69.7

Brown Trout	<200mm	13	28	95	13	667	31	203	270	27.52	326	155.7	46.2
Brown Trout	>=200mm	27	33	46	27	786	333	239	318	296.97	385	339.1	423.3
Brown Trout	All	40	58	91	40	1381	411	420	559	366.96	676	279.5	297.6

Site Number: 388
Site Midpoint (Latitude, Longitude): 44.04338453, -103.77130517
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK2, BR3

Date Sampled: 09/16/1997
Site Length (m): 104
Mean Width (m): 6.1
Number of Pass: 3
Conductivity (umhos/cm): 299
pH: 9.7
Water Temperature (C): 15.0
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	32	32	34	32	528	24	308	214	21.25	495	160.8	45.1
Brook Trout	>=200mm	14	16	23	14	264	36	154	107	31.81	248	235.4	134.9
Brook Trout	All	46	48	53	46	792	57	462	321	51.21	743	183.5	72.4
Brown Trout	<200mm	4	3	5	4	50	2	29	20	1.59	46	146.8	36.0
Brown Trout	>=200mm	2	2	6	2	33	14	19	13	12.76	31	342.5	433.0
Brown Trout	All	6	5	8	6	83	14	48	33	12.40	77	212.0	168.3

Site Number: 396
Site Midpoint (Latitude, Longitude): 44.04066846, -103.77461137
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK2, BR2

Date Sampled: 09/16/1997
Site Length (m): 144
Mean Width (m): 5.1
Number of Pass: 3
Conductivity (umhos/cm): 303
pH: 9.5
Water Temperature (C): 14.0
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	62	61	73	62	1187	35	424	481	31.43	682	134.6	29.7
Brook Trout	>=200mm	11	10	16	11	195	29	69	79	25.84	112	241.4	148.7
Brook Trout	All	73	72	86	73	1401	67	500	567	59.54	805	150.7	47.6

Brown Trout	<200mm	18	17	22	18	331	9	118	134	8.04	190	126.6	27.2
Brown Trout	>=200mm	13	13	14	13	253	58	90	102	51.90	145	277.0	229.8
Brown Trout	All	31	43	68	31	837	94	299	339	83.80	480	189.6	112.2

Site Number: 407
Site Midpoint (Latitude, Longitude): 44.03301361, -103.77614426
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK2, BR2

Date Sampled: 09/17/1997 **Conductivity (umhos/cm):** 303
Site Length (m): 101
Mean Width (m): 4.8 **pH:** 7.3
Number of Pass: 4 **Water Temperature (C):** 13.0
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	59	73	92	59	1515	30	723	613	26.60	1163	115.0	19.7
Brook Trout	>=200mm	14	15	19	14	311	51	149	126	45.79	239	246.2	164.8
Brook Trout	All	82	97	115	82	2012	96	960	815	86.05	1545	140.2	47.9
Brown Trout	<200mm	2	2	3	2	41	2	20	17	1.85	32	170.5	50.0
Brown Trout	>=200mm	11	11	13	11	228	111	109	92	99.03	175	353.8	486.0
Brown Trout	All	13	13	15	13	270	113	129	109	100.88	207	325.6	418.9

Site Number: 411
Site Midpoint (Latitude, Longitude): 44.03210666, -103.77970750
Survey Completed by: South Dakota Game, Fish and Parks
Stream Classification: BK2, BR3

Date Sampled: 09/17/1997 **Conductivity (umhos/cm):** 392
Site Length (m): 100
Mean Width (m): 5.8 **pH:** 7.8
Number of Pass: 3 **Water Temperature (C):** 15.0
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	58	130	287	58	2226	77	1300	902	68.43	2092	133.3	34.4
Brook Trout	>=200mm	17	19	25	17	325	45	190	132	40.38	306	227.2	139.0
Brook Trout	All	87	156	257	87	2671	155	1560	1082	138.65	2510	154.6	58.1

Brown Trout	<200mm	1	1	2	1	17	1	10	7	0.60	16	155.0	39.0
Brown Trout	>=200mm	1	1	1	1	17	4	10	7	3.75	16	280.0	245.0
Brown Trout	All	2	2	3	2	34	5	20	14	4.34	32	217.5	142.0

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: 09/18/1997
Site Length (m): 114
Mean Width (m): 6.3
Number of Pass: 3
Conductivity (umhos/cm): 400
pH: 7.7
Water Temperature (C): 12.0
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	27	35	52	27	554	26	307	224	23.30	494	158.6	47.1
Brook Trout	>=200mm	96	112	130	96	1772	405	982	718	361.85	1581	261.2	228.7
Brook Trout	All	123	148	172	124	2342	442	1298	948	394.82	2089	238.7	188.8
Brown Trout	>=200mm	8	8	10	8	127	82	70	51	73.24	113	372.3	648.0
Brown Trout	All	8	8	10	8	127	82	70	51	73.24	113	372.3	648.0
White Sucker	All	4	4	4	4	63	15	35	26	13.03	56	262.3	230.5

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, 1987-1997

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	
Brook Trout >=200mm	Oct 16, 1992	3	3-3	BK2

Brook Trout >=200mm	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
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	
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

Brown Trout >=200mm

Sep 12, 1997

14

13-19

BR2

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	
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
Brown Trout <200mm	Oct 14, 1992	13	13-14	

Brown Trout <200mm	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	
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
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	

Brook Trout <200mm	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	
Brook Trout >=200mm	Oct 14, 1992	16	12-30	BK2
	Oct 12, 1993	14	14-15	BK2
	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
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	

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
	Sep 16, 1997	2	2-6	BR3
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	
Brook Trout >=200mm	Sep 17, 1996	31	31-32	BK1
	Sep 16, 1997	10	11-16	BK2
Brown Trout <200mm	Sep 16, 1997	17	18-22	
Brown Trout >=200mm	Sep 17, 1996	20	20-20	BR1
	Sep 16, 1997	13	13-14	BR2

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	
Brook Trout >=200mm	Sep 18, 1996	23	23-25	BK1
	Sep 17, 1997	15	14-19	BK2
Brown Trout <200mm	Sep 18, 1996	2	2-6	
	Sep 17, 1997	2	2-3	
Brown Trout >=200mm	Sep 18, 1996	21	21-23	BR1
	Sep 17, 1997	11	11-13	BR2
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	
Brook Trout >=200mm	Sep 06, 1995	10	10-10	BK2

Brook Trout >=200mm	Sep 18, 1996	14	14-14	BK2
	Sep 17, 1997	19	17-25	BK2
Brown Trout <200mm	Sep 06, 1995	3	3-3	
	Sep 18, 1996	1	1-1	
	Sep 17, 1997	1	1-2	
Brown Trout >=200mm	Sep 18, 1996	6	6-7	BR2
	Sep 17, 1997	1	1-1	BR3

Site 417

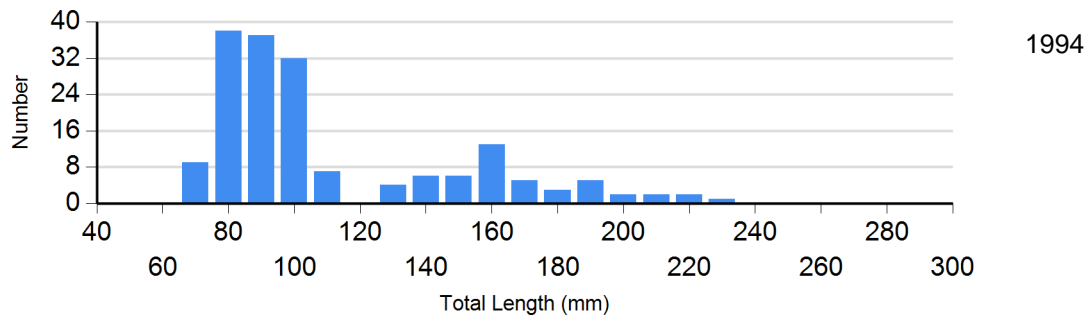
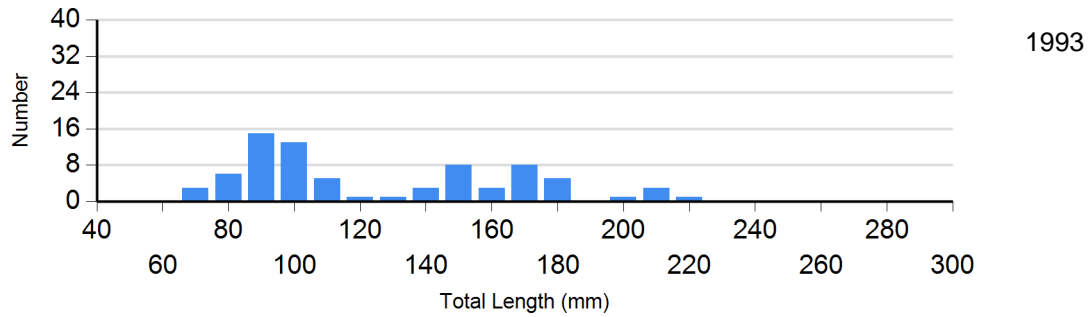
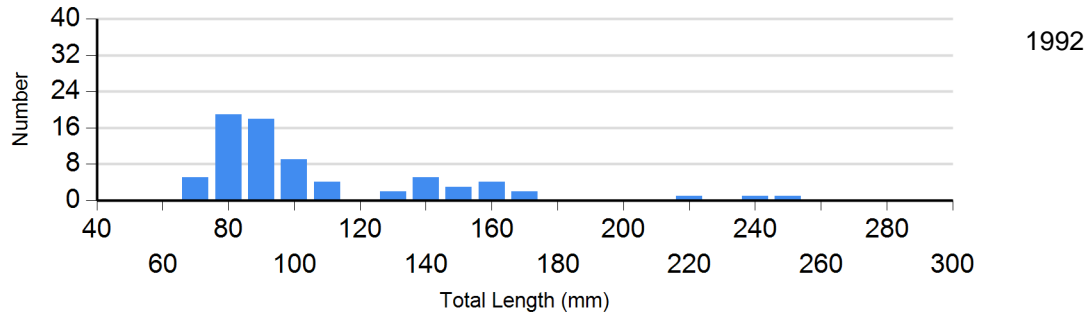
Species/Size	Date	Pop Est.	(95% C.I.)	Stream Classification
Brook Trout <200mm	Sep 24, 1996	31	31-32	
	Sep 18, 1997	35	27-52	
Brook Trout >=200mm	Sep 24, 1996	104	104-106	BK1
	Sep 18, 1997	112	96-130	BK1
Brown Trout >=200mm	Sep 24, 1996	8	8-8	BR2
	Sep 18, 1997	8	8-10	BR2
White Sucker	Sep 24, 1996	9	9-10	

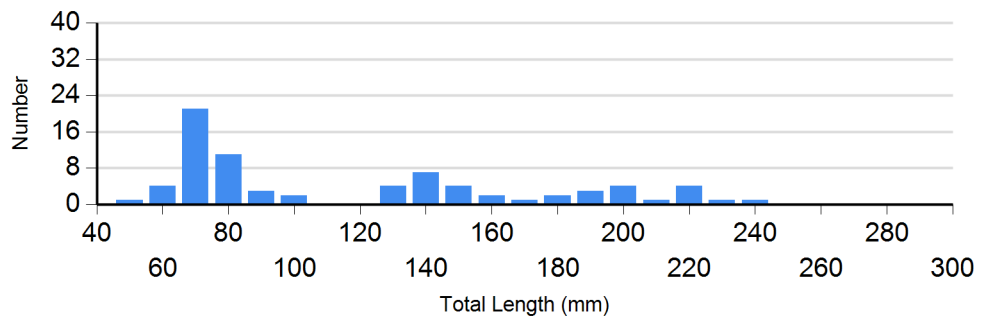
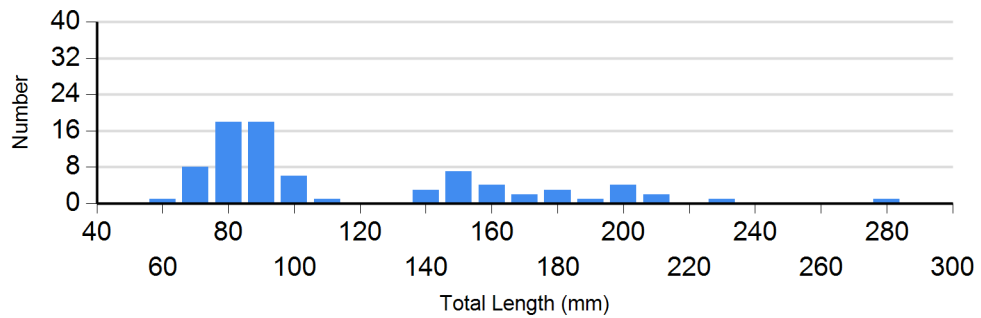
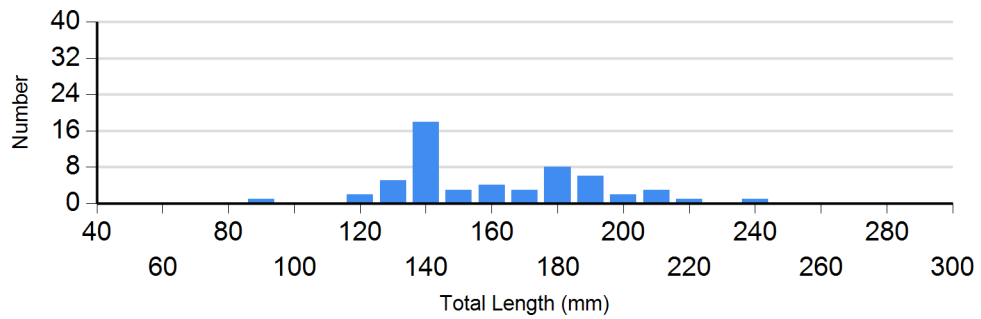
Length Frequency Distribution

Length frequency histogram of species sampled by year.

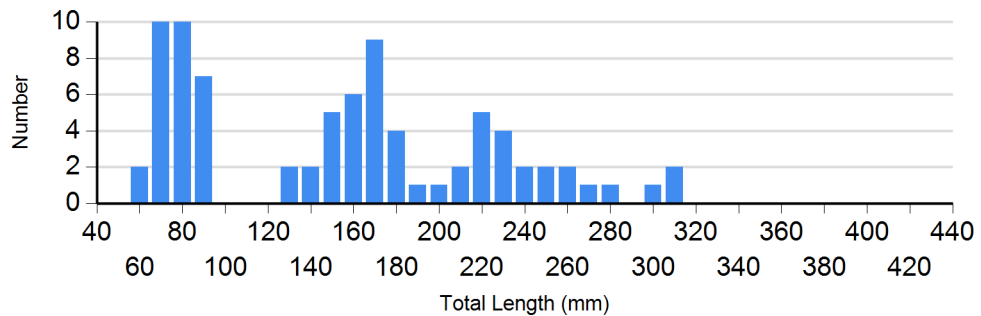
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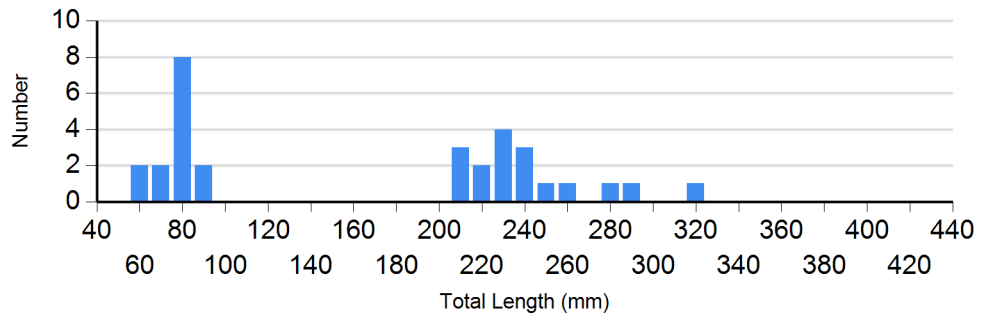
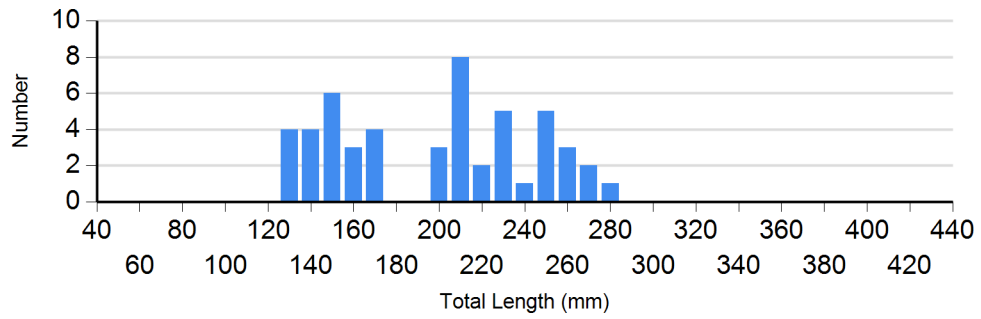
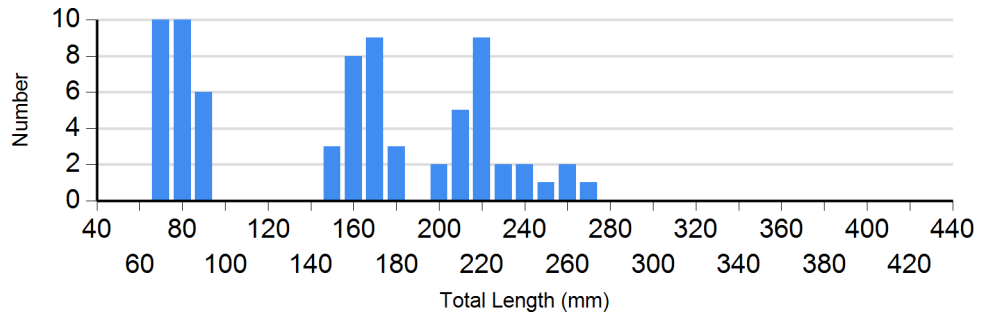
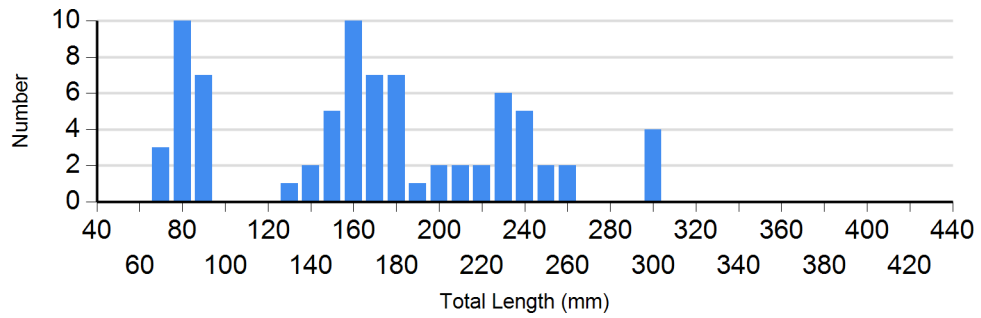
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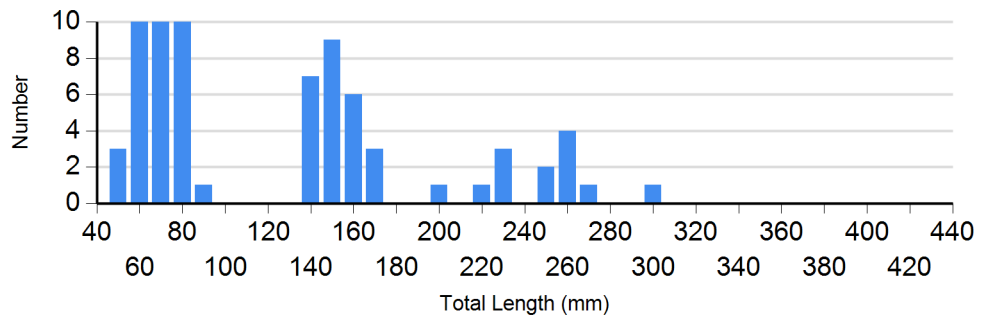




Site: 356
Species: Brown Trout

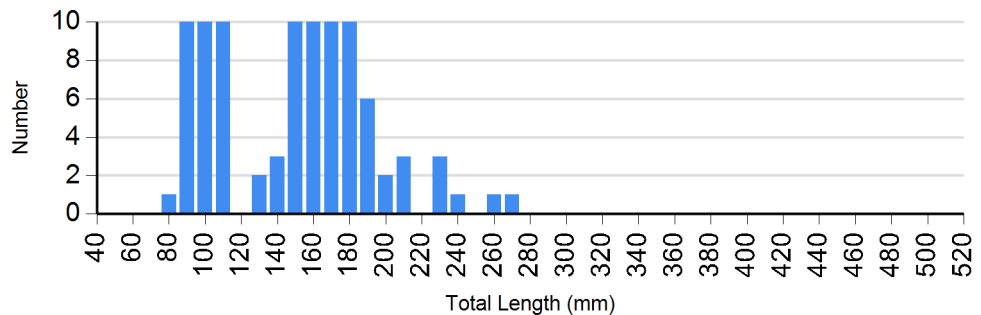




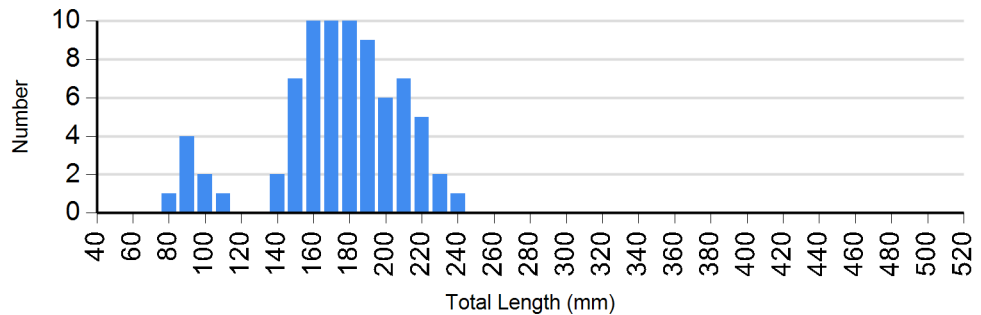


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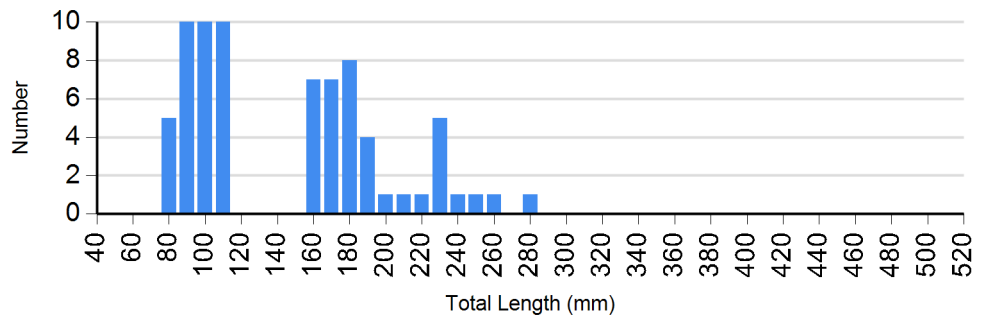
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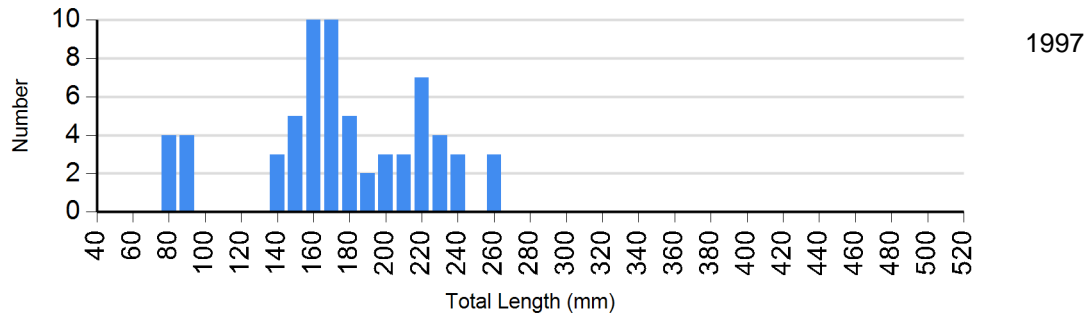
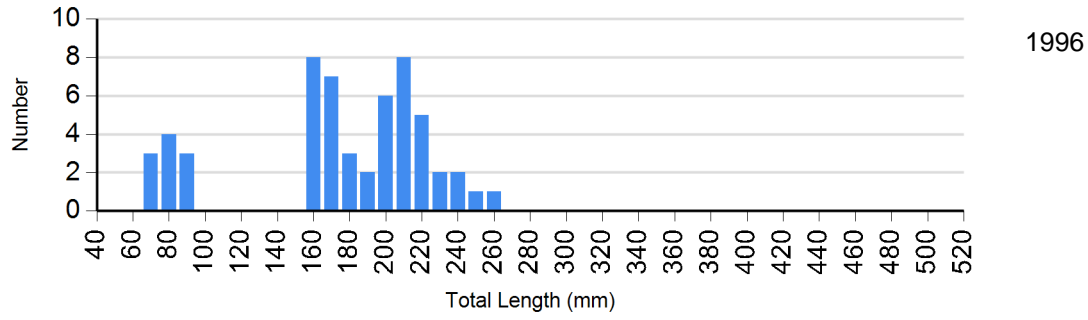
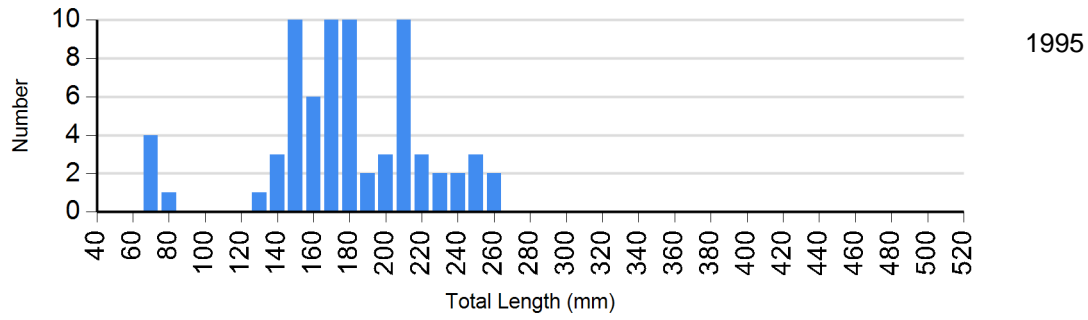
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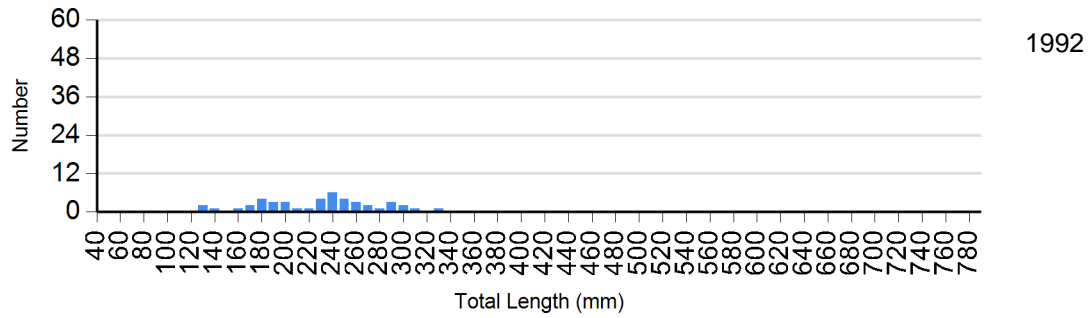
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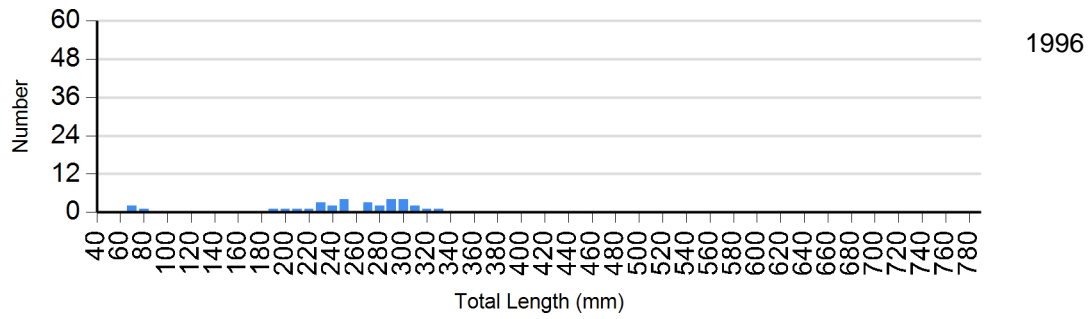
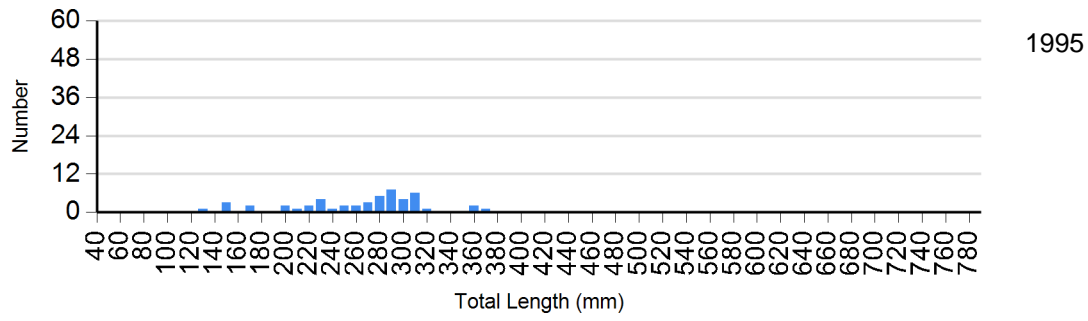
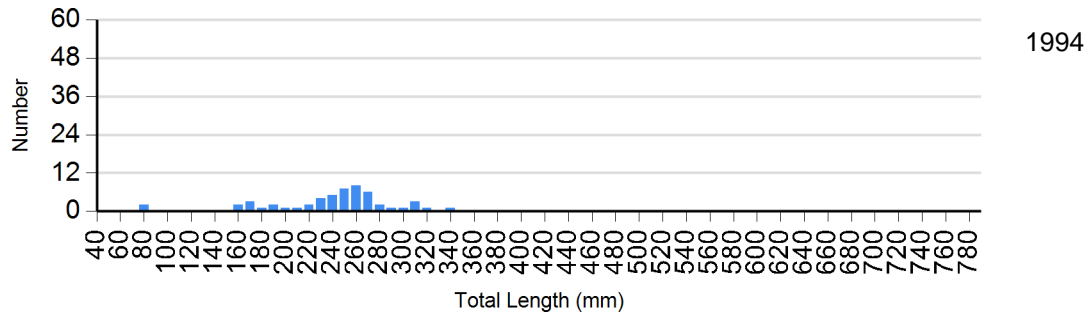
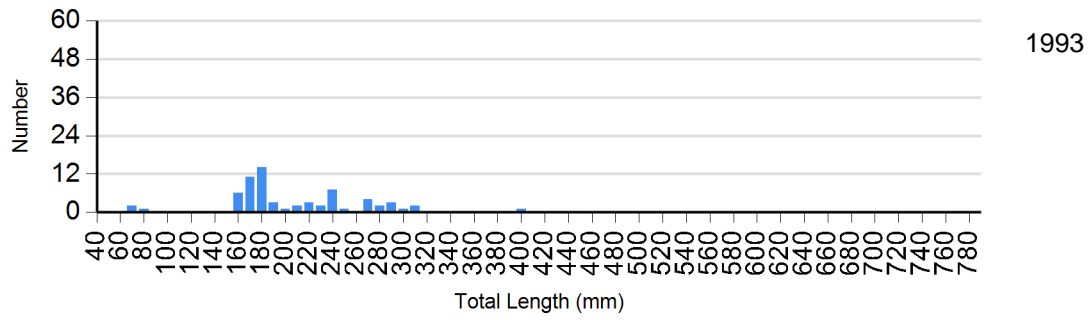


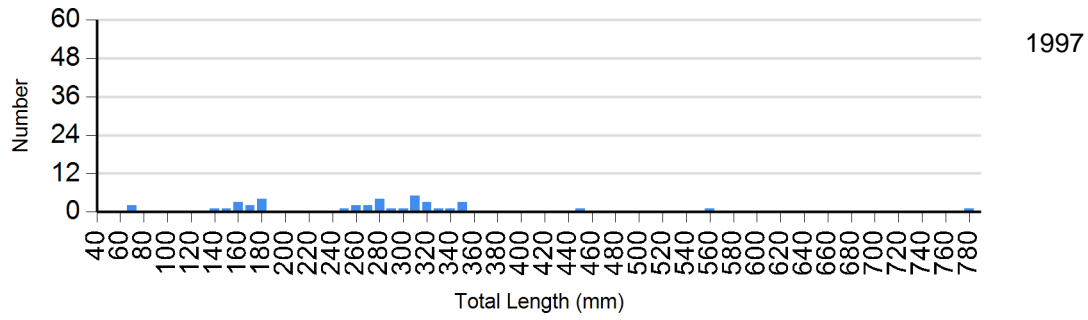
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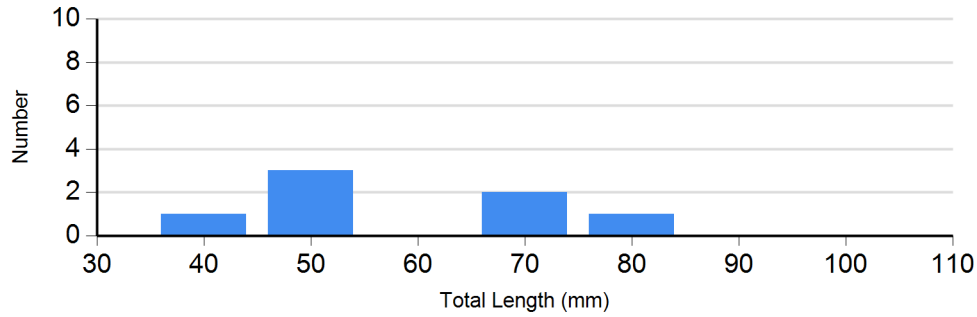
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Species: Brown Trout



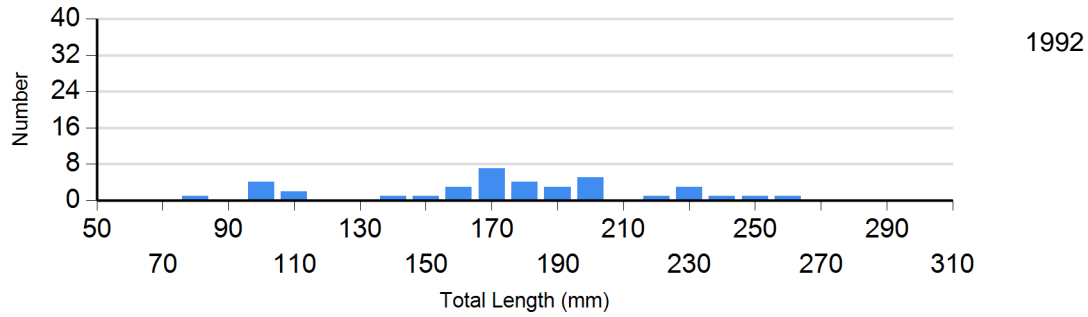


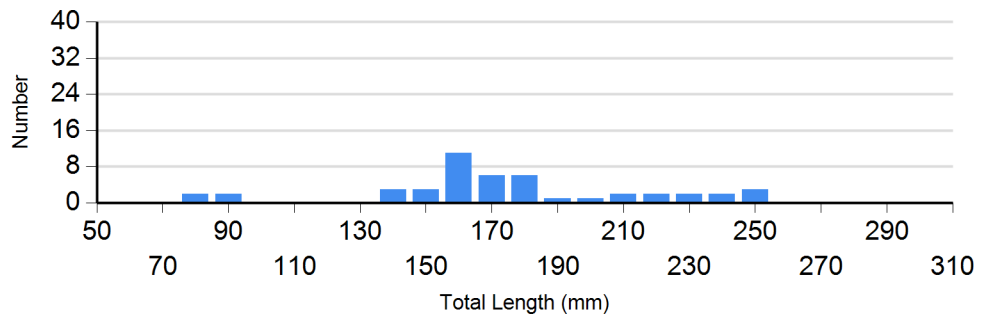
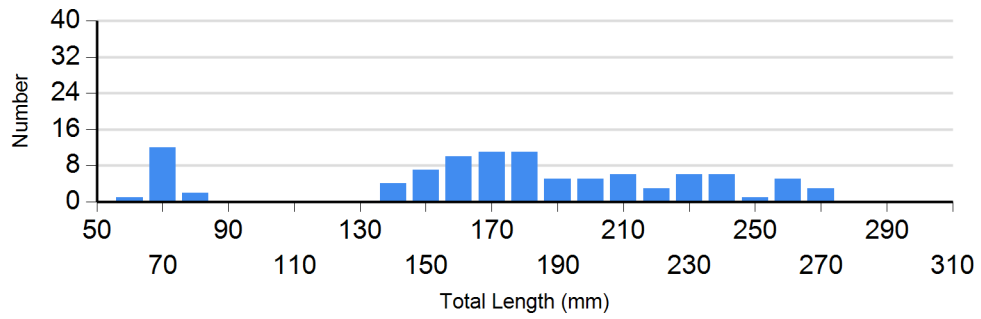
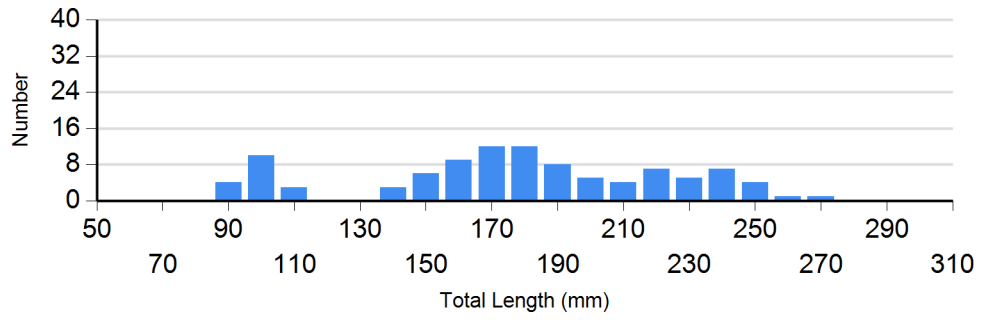
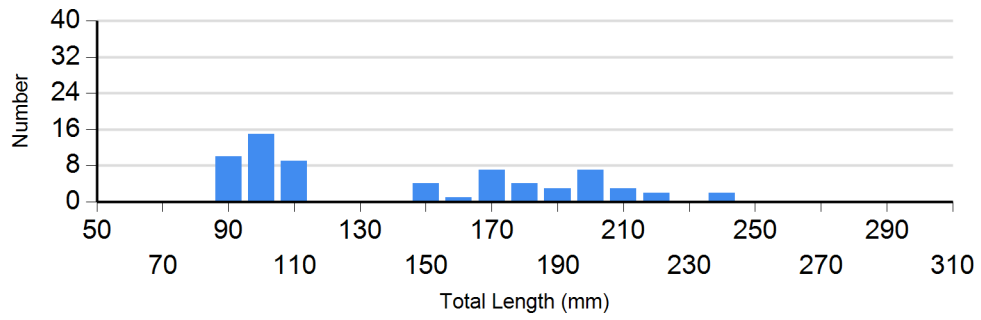


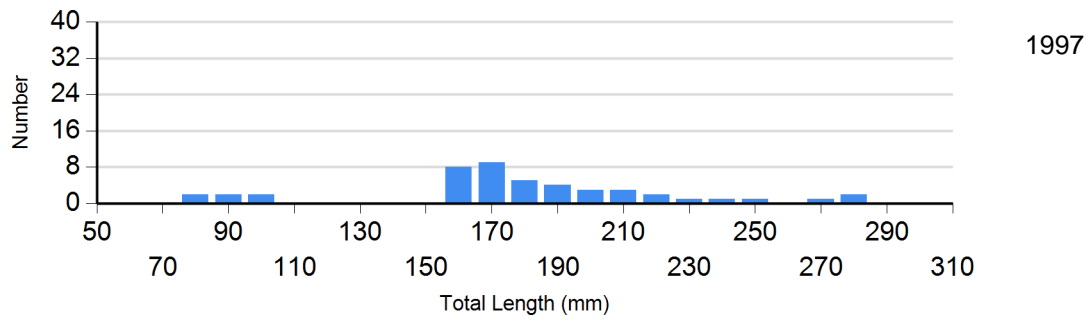
Site: 384
Species: White Sucker



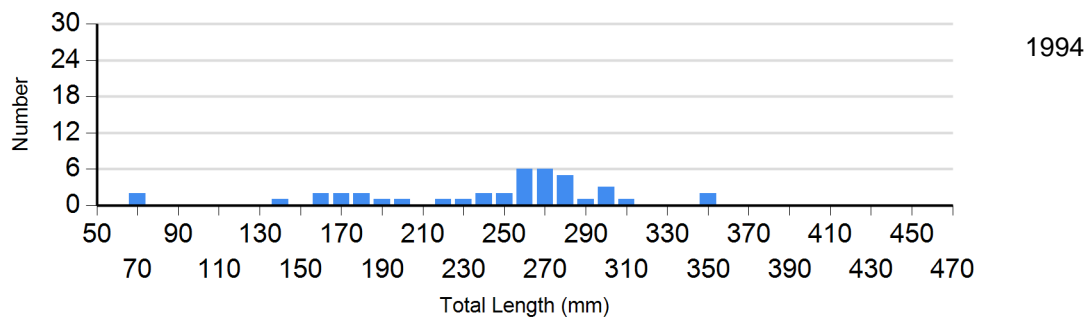
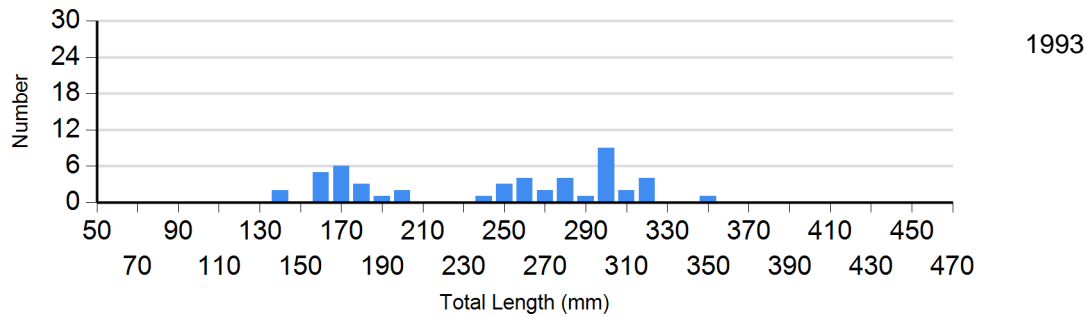
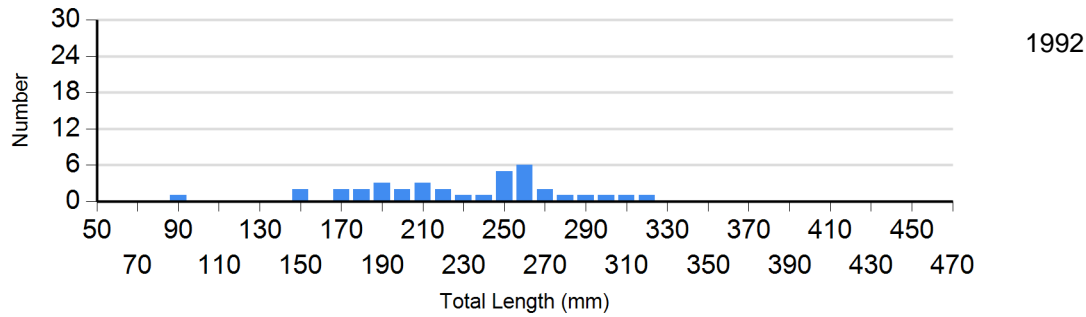
Site: 388
Species: Brook Trout

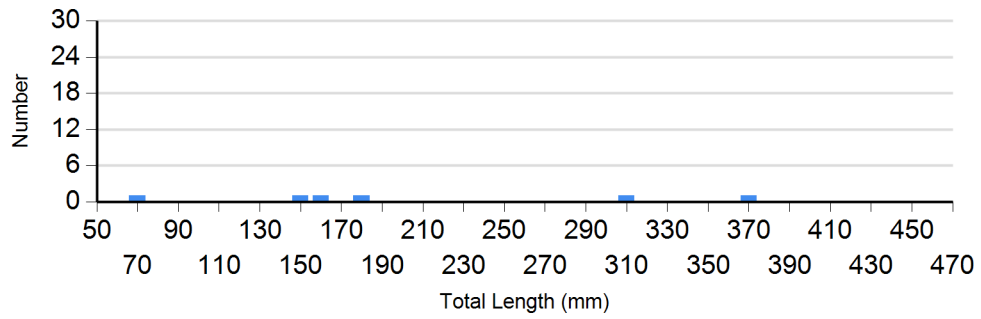
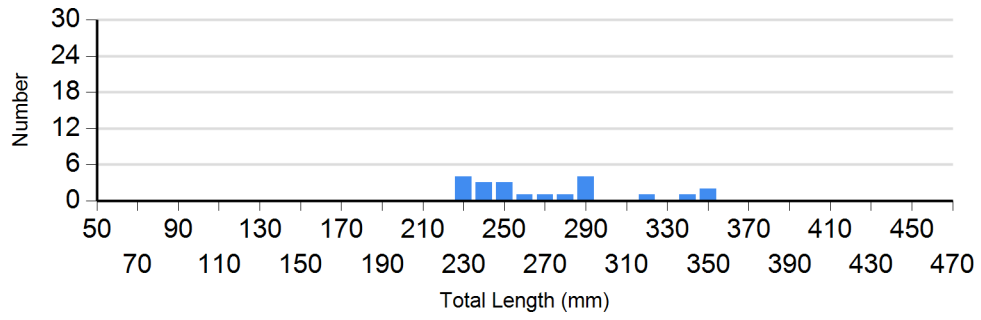
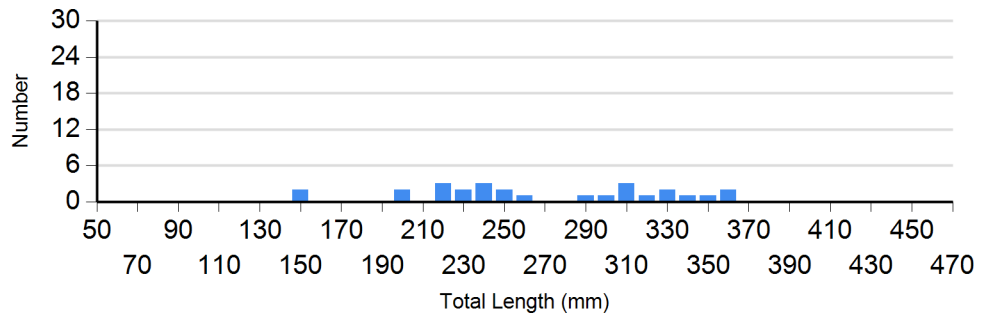




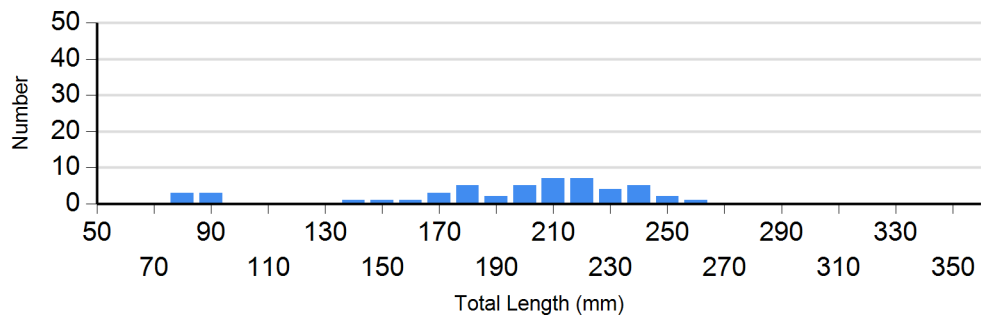


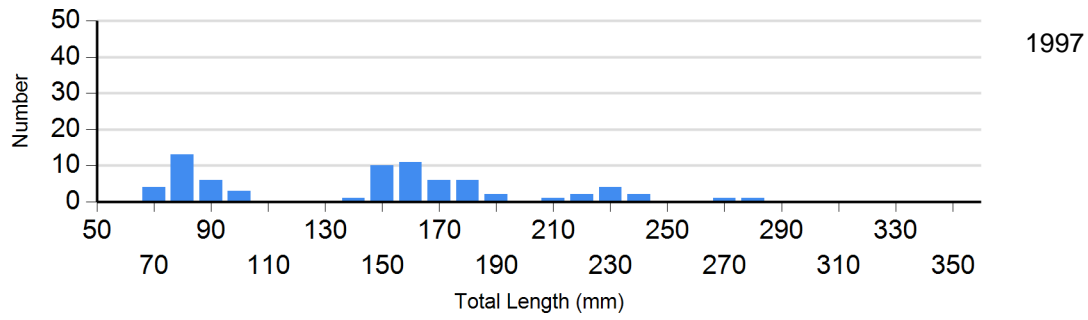
Site: 388
Species: Brown Trout



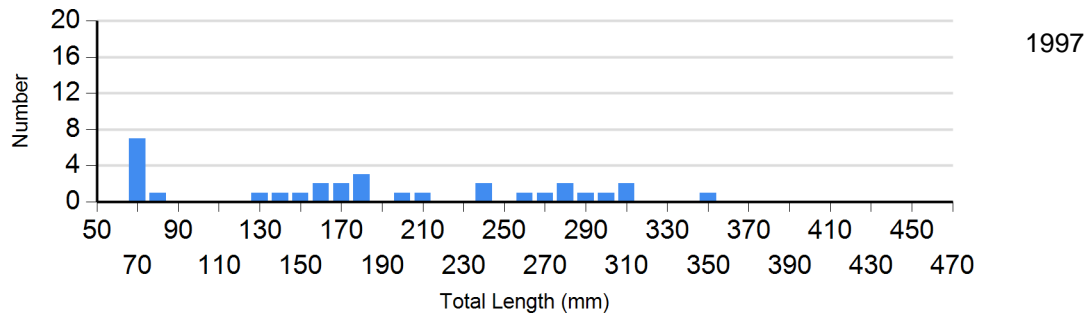
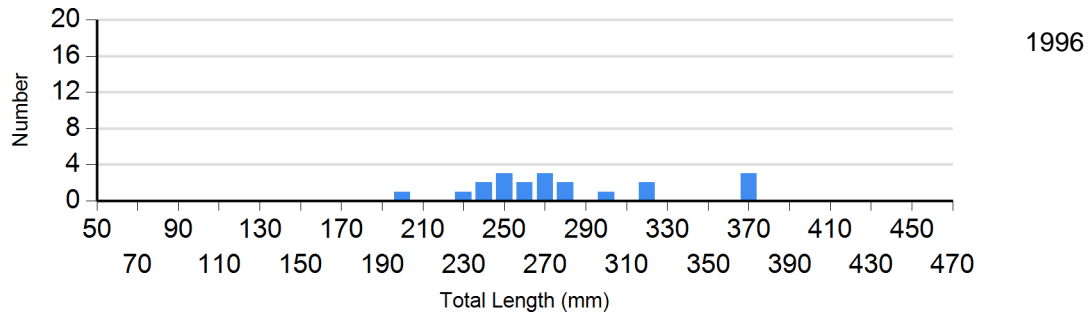


Site: 396
Species: Brook Trout

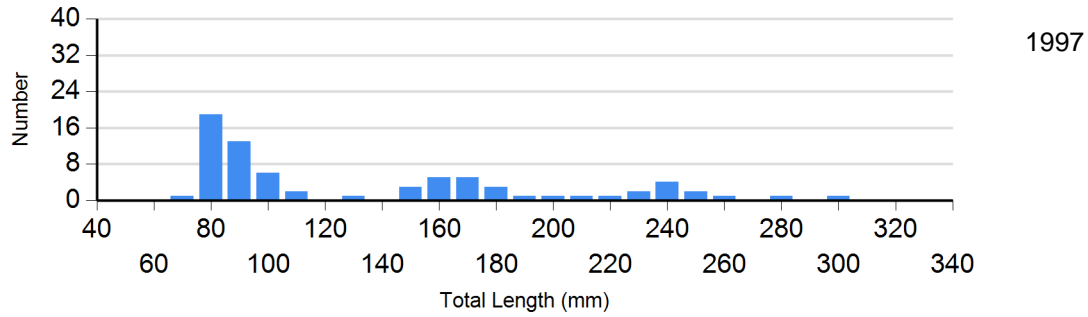
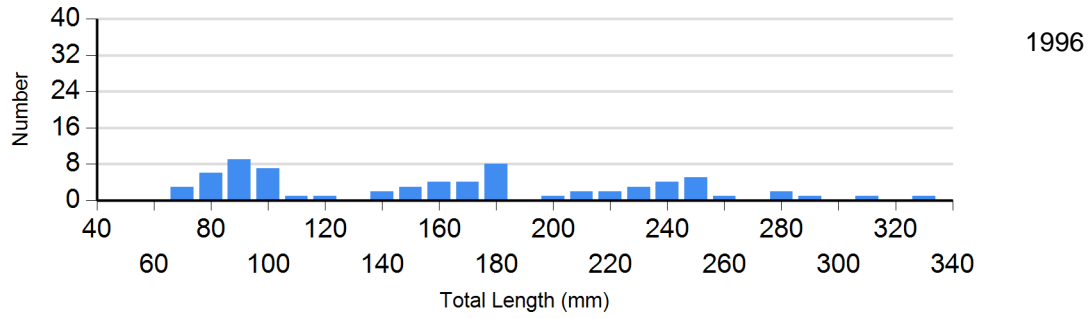




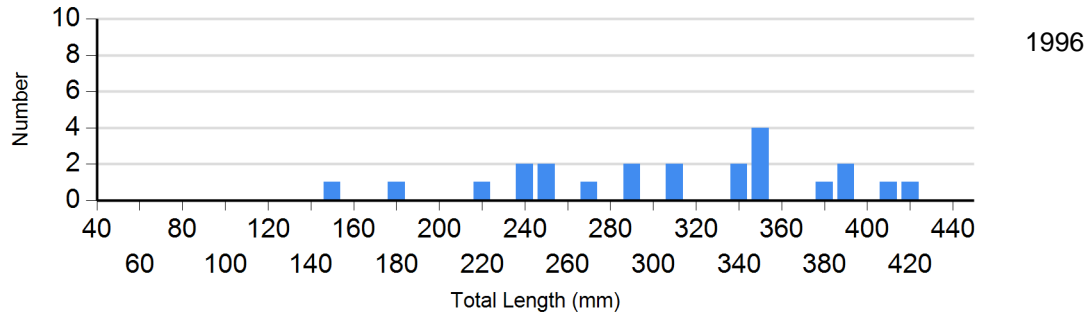
Site: 396
Species: Brown Trout

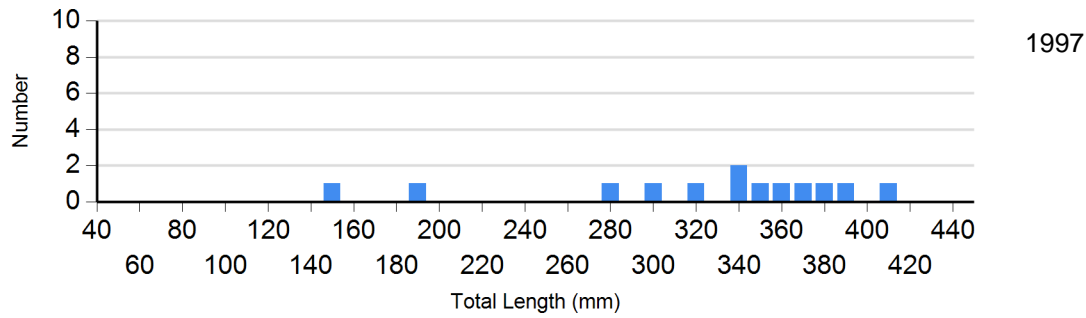


Site: 407
Species: Brook Trout

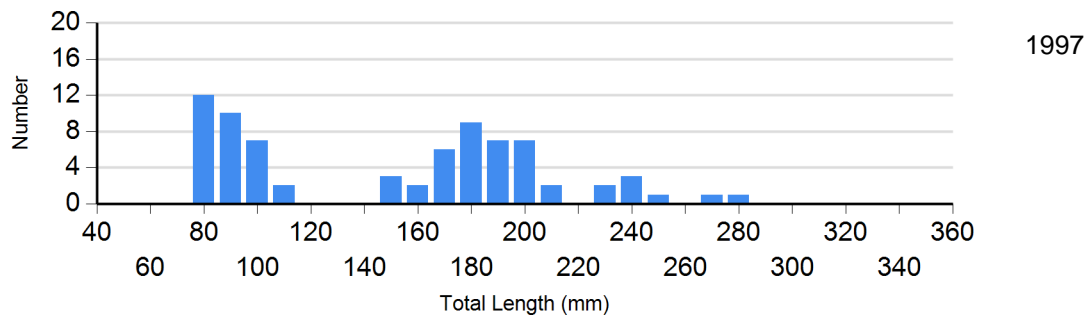
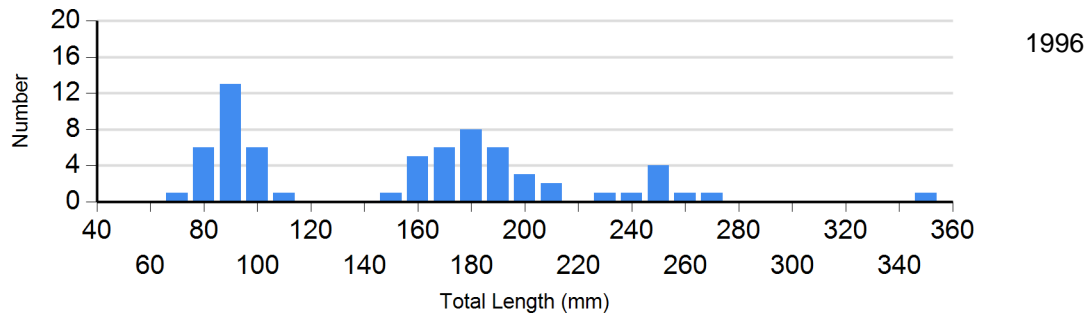
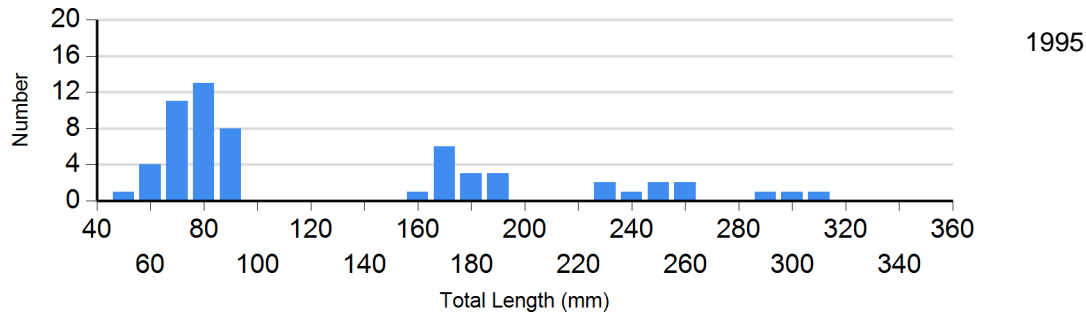


Site: 407
Species: Brown Trout

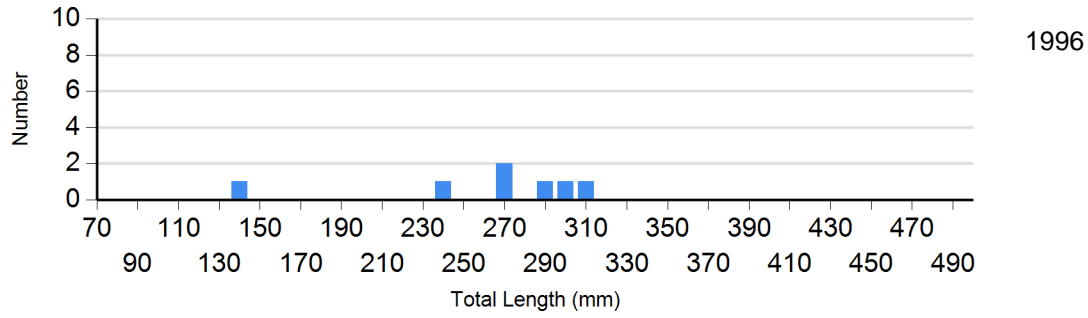




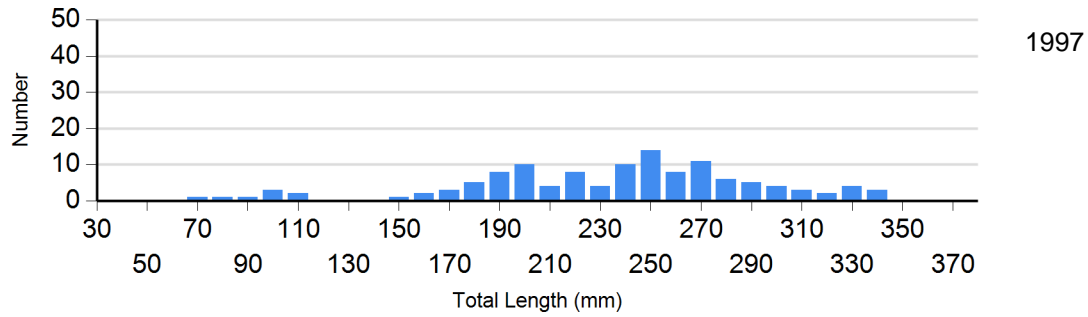
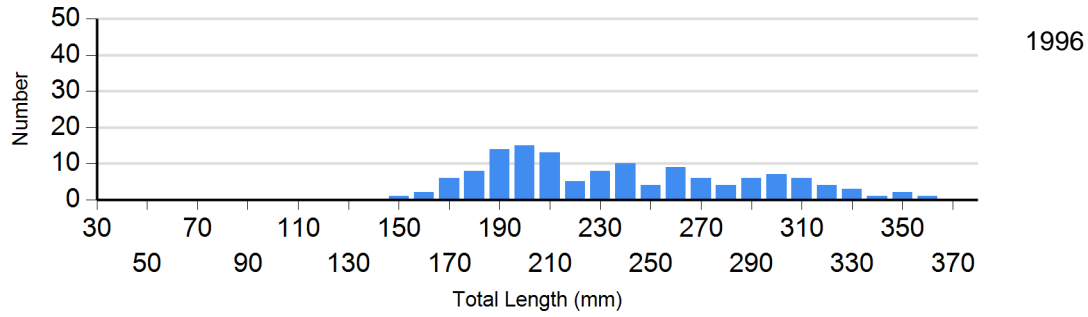
Site: 411
Species: Brook Trout



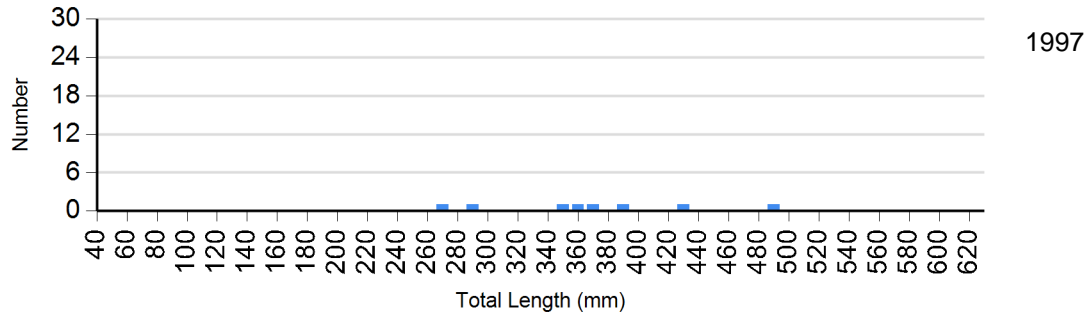
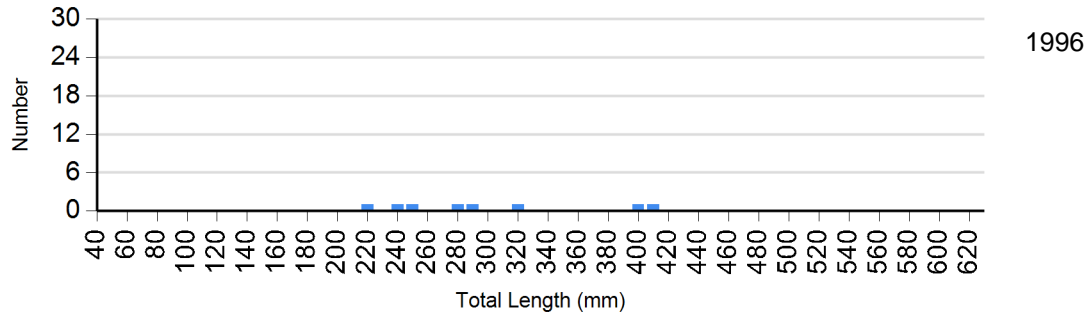
Site: 411
Species: Brown Trout



Site: 417
Species: Brook Trout



Site: 417
Species: Brown Trout



Site: 417
Species: White Sucker

